Financial health protection in Swaziland: an assessment of financial catastrophe and impoverishment from out-of-pocket payments

By

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Part 0: Preamble

Declaration

I, Cebisile Ngcamphalala, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

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Dedication

I dedicate this study to my family and friends. Thank you for all of the love, support, encouragement and dedication you gave me through the course of my studying.

Unto the Almighty God, honour and glory I give.

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Abstract:

As the drive towards universal coverage is gaining momentum globally, the need for assessing levels of financial health protection in countries, particularly in the developing world, has increasingly become important. Health financing system is among the key elements to be strengthened if countries are to achieve the aspirational goal of universal coverage, which includes financial health protection. The performance of Swaziland's health financing system, in terms of ensuring financial health protection, is not clearly understood. This study assesses financial catastrophe and impoverishment from out-of-pocket payments, and the associated factors that predict them in Swaziland. Catastrophic health expenditure disrupts households' welfare and consequently pushes households into poverty. The Swaziland Household Income and Expenditure Survey (SHIES) for 2009/2010 was used for the analyses. Financial catastrophe was assessed using a variable threshold. Impoverishment was assessed using both a national poverty line and the $1.25/day international poverty line. Logistic regression models were used to assess factors that predict household vulnerability to financial catastrophe and impoverishment. It emerged that about 9.6 per cent of Swazi households experienced financial catastrophe, while about 1.1 per cent were pushed below the poverty line as a result of out-of-pocket payments. Factors associated with households' vulnerability include: education of the household-head, household size, location, age and the household socio-economic status. The study findings indicate that financial health protection is not adequate in Swaziland. Thus, there is a need for concerted efforts toward protecting households from incurring financial catastrophe and impoverishment due to out-of-pocket payments. This will involve the institution of exemptions for vulnerable groups, and the use of financing mechanisms that do not place undue hardships on the poor and vulnerable.

1 Part A: Study protocol

1.1 Introduction

The World Health Organization (WHO) has defined Universal Health Coverage (UHC) as ensuring that all people obtain the health services they need, which should be of good quality without suffering financial hardship when paying for them (WHO, 2010). This implies that individuals should not be denied access to health care services because of inability to pay or risk impoverishment by using health care. In essence, UHC covers two priorities, that is, access to health and guaranteed financial protection. The support for UHC has since gained momentum globally, such that it has become a major priority for organization such as, the WHO and the World Bank. It has also been proposed as the main framework for health targets in the sustainable development agenda post Millennium Development Goals (MDGs), and as better means to foster healthy lives (Brearly, Marten & O'Connell, 2013). Again, UHC is the most feasible approach for countries if they were to realise the human right to health, including low income countries (WHO, 2010). However, without a well-functioning health financing system the latter can only be achieved for a small minority of the populations (WHO, 2010). It is the health financing system that determines whether people can have access to use health services without experiencing exorbitant out-of-pocket health payments and risking impoverishment. Thus, it goes without debate that health financing is an important element of wider efforts to foster social protection in health (Brearly, Marten & O'Connell, 2013; WHO, 2010).

Health system financing could comprise of collections from direct out-of-pocket payments (such as co-payments and user fees at the point of service), tax revenue and prepayment mechanisms such as health insurance (McIntyre, 2007). However, evidence has shown that out-of-pocket payment is the worst form of health financing, and it is associated with catastrophic health expenditures and household impoverishments (WHO, 2010). Catastrophic expenditure is defined as health care payment levels that force households to reduce spending on other basic necessities (e.g., food, education and shelter), including the sale of productive assets[1] or incurring high levels of debts. Such payments may impoverish households (Wagstaff & van Doorslaer, 2003). Impoverishment resulting from out-of-pocket payments is when an individual or a

[1] A productive asset is an income generating property to the household, e.g., land.

household is pushed below the poverty line[2] as a consequence of such payments (McIntyre, 2007). It is estimated that about 150 million people globally suffer catastrophic health expenditures while about 100 million are pushed below the poverty line as a result of out-of-pocket payments (WHO, 2010).

Similar evidence has been observed in various studies conducted both in developing and developed countries (Xu et al., 2007; van Doorslaer et al., 2007; Xu et al., 2003). In view of the evidence, the World Health Organization is calling on countries to move away from relying on direct out-of-pocket payments, and to adopt pre-payment mechanisms particularly mandatory mechanisms which have been found to offer financial risk protection and sufficient risk pooling[3] (WHO, 2010). However, despite the apparent detrimental effects of out-of-pocket payments observed in various studies, evidence continues to show that a substantial number of countries still rely on out-of-pocket payments as a dominant health financing mechanism, particularly in developing countries (McIntyre et al., 2006).

Swaziland is a lower-middle income country with a population of approximately 1 million people according to the 2012 projection (Central Statistics Office [CSO], 2015). Like most other countries in Southern Africa, Swaziland's health financing system consists of tax payments (estimated to constitute 18% of General Government Expenditure on health as a percentage of the total expenditure on health), for profit private health insurances (19%), out-of-pocket payments (11%) and donors (22%) (WHO, 2015b; Mathauer et al., 2008). Government health spending as a percentage of GDP is estimated at 6% whilst 27% of this is private health expenditure (WHO, 2012). The health service delivery system consists of both formal and informal sectors. The formal health service sector is largely public (45%), followed by private service providers (28%), then mission (15%) and lastly industry (12%) (SNHP, 2007-2015). On the other hand, the informal sector consists of traditional and other unregulated service providers (Mathauer et al., 2008). The country is among countries that have not abolished user fees completely but instead

[2] Poverty line is defined as deprivation of wellbeing and a lack of command over basic -commodities like food and water.

[3] Risk pooling is risk sharing across a group of people or across the entire population, so that unexpected health care expenditure does not fall solely on an individual or household such that both individuals and households are protected from catastrophic health expenditures (McIntyre, 2007).

have subsidies extended mostly to mission facilities so that they may offer services that are deemed basic at an affordable price to the public (Swaziland National Health Policy [SNHP] (2007-2015).

1.2 Problem statement

Swaziland health spending levels compares favorably to most set targets by the WHO for low income countries if they were to attain the goal of UHC. For example, out-of-pocket as a percentage of total health expenditure has been consistently below the set target of 15-20% since 2010 and reaching up to 11% in 2012 (WHO, 2015b). Similar observations have been noted with regard to general government expenditure on health as a percentage of GDP. Currently the country is recording 6% which is equivalent to the current target of 5-6% if low income countries were to improve not only their health status indicators and access to care, but also reduce financial catastrophe and impoverishment to negligible levels (WHO, 2015b; McIntyre & Meheus, 2014). However, a substantial amount comes from private sources with little redistribution or cross-subsidisation.

Further, the country's National Health Policy (SNHP) acknowledges and advocates for the use of need as a criterion to access health services instead of price (user fees) (SNHP, 2007-2015). However, the high potential for financial catastrophe still remains. Currently, a mandatory prepayment mechanism does not exist, and according to a feasibility assessment and financial projection for a Social Health Insurance (SHI) conducted by WHO in 2008, the country lacks effectual exemption mechanisms for the poor from health care payments despite having the latter stated in the SNHP. The assessment found that implementing SHI for all Swazis was feasible and with a potential for gradual extension of coverage to the informal sector over 10 years. However, this has not been implemented as yet (Mathauer et al., 2008). The above challenges have given rise to equity and financial protection concerns, particularly because there is limited evidence on how the current health financing systems is adequately ensuring financial health protection and equal access to care across segments of the population in Swaziland.

Evidence from studies conducted among low income countries, including those in Africa, have showed that a lack of health financing reforms such as mandatory prepayment mechanisms and effectual exempting mechanisms for the poor from health payments, increases the likelihood for poor households to experience catastrophic health

expenditures and impoverishment (Xu et al., 2003). In addition to the lack of mandatory pre-payment mechanisms, the availability of health services requiring payment and low capacity to pay have also been identified as preconditions for catastrophic payments (Xu et al.,2003; McIntyre & Meheus, 2014).

Currently, WHO, as informed by evidence has recommended minimum health spending levels for low-income countries if they were to attain financial health protection. However, there have been special cases whereby other countries had fair health spending levels but still lack adequate financial health protection for their population (McIntyre & Meheus, 2014). Similar concerns are held about Swaziland. The country's health spending levels compares fairly to most set targets, but this may not necessarily translate to equitable access to health care across the different income groups. Partly, this could be caused by the fact that the poor may remain unaccounted for since they are too poor to make any health payments, and consequently they end up being classified among those who are protected (WHO, 2013). Evidence from Leive & Xu (2008), on a study assessing households' coping mechanisms against out-of-pocket health payments in 15 African countries, shows that more than 30% of those households found both in the lowest and 3rd quantile of income distribution in Swaziland had the sale of productive assets and borrowing as their coping mechanisms against out-of-pocket health payments. However, the study did not report any incidences of catastrophic payment.

It is therefore of central concern that Swaziland has no baseline evidence to inform discussions and actions aimed at addressing issues of financial health protection in the country. Therefore, this financial protection assessment intends to bridge the existing gap in knowledge and further provide evidence of the country's status on health equity and if its financial protection is consistent with its current health spending levels.

1.3 Study rationale

The slow progress towards adopting financial health protection mechanisms by many countries have been attributed to a number of factors among which is the lack of context specific evidence to guide policy change (McIntyre, 2007). This is also the case in Swaziland. Currently, to the knowledge of the author, no assessment of financial catastrophe and impoverishment from out-of-pocket health payments has been conducted. As a result, there is a dearth of evidence on the country's financial health

protection status and associated risk factors. This information is crucial for better health protection policy guidance.

1.4 Purpose of the study

Primary aim:

- To assess the consequences of direct out-of-pocket payments on individuals and their households in Swaziland.

Specific objectives

- To quantify the catastrophic effect of out-of-pocket health care payments in Swaziland.
- To assess the impoverishment effects of out-of-pocket health payments in Swaziland.
- To assess factors associated with the absence of financial protection in Swaziland.
- To provide policy recommendations on how to address and improve financial health protection in Swaziland.

1.5 Brief literature review

Assessment of financial protection gained prominence after the publication of the World Health Report 2000 (McIntyre, 2010). Since then, methodologies to assess equity in health financing systems have been developed under the notion of protecting individuals and their households, particularly the poor from experiencing catastrophic health expenditure (Wagstaff, 2001). In support for financial risk protection, Wagstaff & van Doorslaer (2003), suggested methodologies for assessing and measuring fairness in health care financing. These methodologies were based on the conventional FGT

(Foster-Greer-Thorbecke,1984)[4] poverty indices and are termed catastrophic and impoverishment methodologies (Wagstaff & van Doorslaer, 2003). The catastrophic and impoverishment methodologies were based on the premises of the Grossman-Wagstaff model of demand for health. This theory asserts that the cost of health care is reflected in the amount of household consumption foregone so as to purchase health care (Grossman, 2000).

The catastrophic and impoverishment methodologies have been criticised for solely focusing on the direct impact of out-of-pocket payments for health care on households and neglecting indirect costs. However, despite the criticisms, these conventional methodologies have remained largely used by many in the field (Wagstaff & van Doorslaer, 2003). In support for these methodologies, Kutzin, (2010) and Hsiao (2003) argued that given the evidence of adverse effects of out-of-pocket payments on households, it would be appropriate to use out-of-pocket payments as a focal variable for policy makers in attaining financial health protection in a health system. Also, both catastrophic and impoverishment methodologies are based on an assumption that households do not choose to spend excessively on health care (health care expenditure is not discretionary) and that household income is fixed (O'Donnell et al., 2008). On the contrary, it is argued that this assumption does not always hold given that households' health payments can be smoothed over by dissaving or borrowing and at times by a decision not to spend on health care than experiencing catastrophic payments (Flores et al., 2008).

A summary of the review of methodological and empirical studies using the conventional methodologies is briefly presented below.

Catastrophic health care payments

[4]FGT indices as used in conventional poverty measurement show the extent, intensity and the severity of poverty (Foster et al. 1984). The extent of poverty is indicated by the headcount measure, while the intensity and severity of poverty are indicated by the gap measures.

In measuring out-of-pocket payments in relation to catastrophic expenditures, the catastrophic methodology uses a predetermined threshold. The threshold is arbitrary in nature, as a result, various thresholds are often used. However, there have been concerns regarding the use of different thresholds as it often leads to different results. To address the latter, it has since been agreed that all thresholds levels should be reported instead of reporting on one and the decision should rest with readers (Xu et al., 2010; Russell, 2004). In addition, evidence has showed that households of different socio-economic statuses have different marginal utilities[5] with regards to their income, and thus applying a standard threshold across may preclude equity considerations. In support of this notion there is an argument that fairness should be defined in the indices for measuring catastrophic out-of-pocket payments (Ataguba, 2012).

Studies carried out in Africa using the catastrophic methodology have shown a high financial burden on households due to direct out-of-pocket payments. A positive relationship between catastrophic and out-of-pocket payments has also been observed in a multi-country study, consisting of 59 countries. In ten of these countries, it was estimated that about 3% of households incurred catastrophic expenditures (Xu et al., 2003). Further evidence of high levels and intensity of both financial catastrophe and impoverishment due to out-of-pocket payments have been shown in studies conducted in Ghana and Nigeria (Akazili, 2010; Ichoku, Fonta & Onwujekwe, 2009). Most recently, about 23% of Ugandan households were reported to be facing catastrophic health expenditure (Kwesiga, Zikusooka & Ataguba, 2015). Similar trends have been observed across Asia, Europe and South America as well (van Doorslaer et al., 2007; Xu et al., 2003).

While the methodology of assessing catastrophic payments is useful, it fails to show the absolute impact of out-of-pocket health payment on households, given that households could still be pushed into poverty even by a health payment burden of less than 1% (Goudge et al., 2009).Therefore, it remains important to assess the impoverishment associated with out-of-pocket payments.

[5] Marginal utility is a notion of utilitarianism. This philosophy advocates for maximization of total utility for everyone in society. While utility is a measure of satisfaction that one obtains from his/her circumstances.

Impoverishment due to out-of-pocket health care payments

This methodology is based on the argument that spending on health care is unpredictable and may result in financial shocks and impact a household's welfare negatively. In principle, no one ought to be pushed or deepened into poverty as a result of health payments (Wagstaff & van Doorslaer, 2003). Health payments can be impoverishing if they compromise households' expenditure on basic non-medical goods and services such as food and education of household members (Wagstaff & van Doorslaer, 2003). Another argument behind the assessment of the impoverishing effects of health payments is sustained by van Doorslaer et al., (2006), who assert that the conventional approaches to measuring poverty do not capture this form of impoverishment since they are not adjusted for health care costs. This applies even to higher poverty line in spite of them having room for health expenditure to a certain extent. This is because health care needs are highly variable both across time and individuals (O'Donnell et al., 2008; van Doorslaer et al., 2006). A famous methodology for assessing the impoverishing effects of health payments is by Wagstaff & van Doorslaer (2003). Although, this methodology is subject to the choice of a poverty line, it is considered to be more objective than the catastrophic methodology. This is because it compares household resources net of out-of-pocket against absolute poverty thresholds (Wagstaff & van Doorslaer, 2003).

The assessment of impoverishment associated with direct out-of-pocket health care payments has not been widely studied in many African countries. A review of some of the studies previously conducted mainly in Nigeria, Tanzania and Ghana and most recently in Uganda showed a high level of impoverishment due to out-of-pocket payments (Kwesiga, Zikusooka & Ataguba, 2015; Leive & Xu, 2008) . In Ghana, high impoverishment was associated with high levels of out-of-pocket payments, which constituted a bigger share of total health sector financing (Akazili, 2010). Similar findings were observed in Nigeria where individuals and their households had their level of poverty increased due to high levels of out-of-pocket payments (WHO, 2013; Ichoku, Fonta & Onwujekwe, 2009). In Uganda, based on the Ugandan national poverty lines, about 4% of the population was impoverished by out-of-pocket health payments (Kwesiga, Zikusooka & Ataguba, 2015). These findings were found consistent with those reported in Asian countries (van Doorslaer et al., 2007; van Doorslaer et al., 2006).

Furthermore, out-of-pocket payments may not only push households to poverty but evidence has showed that it can deepen levels of poverty and leave households in a

perpetual state of poverty (known as a poverty trap) (Akazili, 2010). This phenomenon is mostly observed among households who were previously poor before making health care payments. The catastrophic and impoverishment methodologies also have limitations. They do not provide information on those who cannot afford to use health services as a result of health costs (Moreno-Serra, Millett & Smith, 2011; Wagstaff & van Doorslaer, 2003). Consequently, this group is then misclassified as financially protected which then results in an underestimation of the adverse consequences of out-of-pocket health payments (Moreno-Serra, Millett & Smith, 2011). Thus, it is important to assess households' vulnerability to financial risk.

Household's vulnerability to financial risk

Household vulnerability is the likelihood of a household facing risk that may cause its welfare to decline (Dercon, 2005). There is consensus on the need not only to report the catastrophic and impoverishment measurements, but also to report the factors associated with households' vulnerability to catastrophic health spending and impoverishment (Moreno-Serra, Millett & Smith, 2011; Xu et al., 2007). It is alleged that such information can guide policy makers to better target financial-risk protection strategies.

The factors attributing to households experiencing catastrophic health spending greatly varies across developed and developing countries. Samkorata (2009), reported that in high income countries, the risk of experiencing catastrophic health payments lies mostly with better-off households mainly because they prefer expensive services. These findings differ greatly with those found in low income countries, particularly in Africa, where it is the poor who stand a higher risk compared to the better-off (Xu et al., 2007; Xu et al., 2006). In addition to the type of health providers used and low socio-economic status, the following factors have been found common across countries; type of care consumed, household with members aged 60+ or less than 5 years, households members living with a disability or chronic illness, the availability of health services requiring payment and lack of mandatory prepayment health financing mechanisms (Moreno-Serra, Millett & Smith, 2011; Somkotra & Lagrada, 2009; Xu et al., 2003).

1.6 Methodology and analysis

Data source

This study shall employ secondary data from Swaziland Household Income and Expenditure Survey (SHIES) 2009-2010. SHIES is a multi-purpose survey conducted on a nationwide basis by Central Statistical Office of Swaziland (SCS). Households were selected based on a two stage stratified sampling method. In the first stage, 375 enumeration areas (EAs) were selected with probability proportional to size based on 2007 population census framework. At the second stage, within each enumeration areas (EAs) a fixed number of households were selected by systematic random sampling method. The final sample size was 3167 households from which 1373 were urban and 1794 rural (SHIES, 2010).

Data analysis shall be conducted using Stata 12 (Stata Corp, 2012).

Methods

a. Measuring social economic status

To assess the effects of direct out-of-pocket payment on households, the socio-economic status of households shall be measured using household consumption expenditure. Consumption is preferred over income in this context because of both conceptual and practical considerations. Conceptually, consumption is more stable across time than income and practically, it has shown to have less measurement errors. This is because households prefer reporting consumption than earnings due to the fear of taxation among other reasons (Deaton and Zaidi, 2002). Also, the large informal sector found in developing countries further limits the use of income as a measure of household welfare. However, using consumption is not without limitations either. Households have been found to under report expenditure on luxurious items and lifestyle, such as gambling and alcohol. This could result in understatement of poverty estimates (Haughton & Khandker, 2009). Nevertheless, the balance tips in favour of using consumption considering the various aforementioned advantages over using income, particularly in the context of developing countries (Deaton & Zaidi, 2002).

On a different note, reflecting the level of per capita household consumption is of interest mostly with respect to the walfarist approach whose focus is on per capita consumption expenditure when measuring household utility (Akazili, 2010). However, applying this concept alone would be ignoring the fact that some goods and services consumed by

the household have 'public good' characteristics, meaning that they produce benefits for the whole household not just the primary consumer (Haughton & Khandker, 2009; O'Donnell et al., 2008). In addition, there is a concern that consumption needs differs with age and that has to be put into perspective when reporting household consumption expenditure. Thus to reflect economies of scale and consumption needs in the household consumption level, household socio-economic status shall be measured using per adult consumption expenditure estimates adapted from Ataguba & McIntyre (2012).

$$AE = (s_A + \Phi S_K)^{\theta} \text{ for } \theta \geqslant 0, 0 \leqslant \Phi \leqslant 1$$

Where s_A is the number of adults in the household; s_K is the number of children, **Φ** is the cost of children (a measure of the weight accorded to children relative to adults) and θ represent economies of scale. Following recommendations by Deaton & Zaidi (2002), the following values were set; **Φ** = 0.5 and θ = 0.75. Also, Ataguba & McIntyre, (2012) performed a sensitivity test on these values to see if replacing the adult equivalent scale by per capita scale was going to cause any significant change in the results observed, and there was no significant change observed.

Furthermore, since household consumption was used as a measure for households' ability to pay, then an asset index shall be constructed to determine any correlation between household living standards and impoverishment from health payments. The asset index shall be generated using the principal component analysis (PCA) method. PCA is a multivariate statistical technique applied to reduce variables in a data set into uncorrelated coherent subsets (components). The uncorrelated components are a linear weighted combination of the initial variables. This method enables a detailed description of the variation of the subset variables in the original data (Vyas & Kumaranayake, 2006). The asset index, A_i, for individual i is defined below as follows: (method adapted from O'Donnell et al., (2008).

$$A_i = \sum_k \left[f_k \frac{(a_{ik} - \overline{a}_k)}{S_k} \right]$$

Where:

– a_{ik} is the value of asset k to household i

– $\overline{a}_k$ is the sample mean

– S_k is the sample standard deviation

–f_k are the weights associated with the first principal component

b. Measuring out-of-pocket payments

Estimating household out-of-pocket payments

Total out-of-pocket payments for each household shall be computed based on all expenditures made on health and medical care as captured in the survey data. Payments covered by a health insurance or that were reimbursed shall be excluded.

Catastrophic out-of-pocket healthcare payments analysis

Catastrophic out-of-pocket health payments shall be estimated using the methodology adapted from Ataguba (2012). The method uses the inequality aversion parameter to derive rank dependent thresholds, such that it allows for estimation of catastrophic payment relative to the households' level of socio-economic status. This is different to the application of a constant threshold which overlooks equity issues yet is fundamental to a fair health care financing system. In essence, this method implies that catastrophe is a function of where the household sits in the income distribution range (Ataguba, 2012).

Using the rank dependent threshold, three indices for catastrophic health payment shall be computed namely:

- Rank dependent catastrophic head count
- Rank dependent catastrophic payment gap
- The mean positive rank dependent gap

Rank-dependent catastrophic head count

The rank-dependent catastrophic headcount measures the proportion of households in the population or sample that makes catastrophic payments. The indices shall be computed as:

$$H'_{cat} = N^{-1}\left(\sum_{i=1}^{N} E_i^{'}\right) = \mu'_{E'}$$

Where $\mu'_{E'}$ is the mean of E'_i and N is the total sample size. This measure indicates whether households' out-of-pocket payments, expressed as a fraction of total (non-food expenditure) exceed the rank dependant threshold).

Rank-dependent catastrophic payment gap

This captures deviations from the catastrophic threshold across all the observations in the quantiles of gross income irrespective of their health payments through, a concept known as "the overshoot". Overshoot shows by how much the catastrophic incidence exceed the catastrophic threshold. This index allows us to ascertain the intensity of the catastrophic health payments. The indices shall be computed as:

$$G'_{cat} = N^{-1}\left(\sum_{i=1}^{N} O'_i\right) = \mu'_{O'}$$

Where $\mu'_{O'}$ is the mean of O'_i (mean of overshoot)

The mean positive rank dependent gap

Given that the G'_{cat} averages across all the observations, for a detailed analysis, a rank dependent overshoots excluding the zeros (the households whose health payments as a share of their income is below the set threshold) shall be computed. The mean positive rank shall be defined as:

$$PG'_{cat} = \frac{\sum_{i=1}^{N} O'_i}{\sum_{i=1}^{N} E'_i} = \mu'_{o'} \Big/ \mu'_{E'}$$

c. Impoverishment effect of out-of-pocket-payments

The catastrophe measures do not tell to what degree catastrophe payments cause hardship among households. The impoverishment effect of out-of-pocket payment shall be estimated using poverty measures as applied in Wagstaff and van Doorslaer (2003).

Poverty headcount index

This index measures the proportion of households that are poor.
Given that z_{pov}^{pre} = pre-payment poverty line and x_i = individuals (i) pre-payment income. Then we define;

$$P_i^{pre} = 1 \text{ if } x_i < z_{pov}^{pre}$$

Then the pre-payment poverty headcount is defined as:

$$H_{pov}^{pre} = \frac{1}{N}\sum_{i=1}^{N} P_i^{pre} = \mu_{P^{pre}}$$

Where *N* is the sample size. It important to note that H_{pov}^{pre} does not capture the "depth" of poverty hence the need to measure the poverty gap.

Poverty gap index (G).

This index gives the depth or extent of the poverty, that is, the amount (%) by which poor households fall short of reaching the poverty line (G). Denote g_i^{pre} the pre-payment poverty gap. This is equal to $x_i - z_{pov}^{pre}$ if $x_i < z_{pov}^{pre}$, and zero otherwise. Then *pre-payment poverty gap* is defined as:

$$G_{pov}^{pre} = \frac{1}{N}\sum_{i=1}^{N} g_i^{pre} = \mu_{g^{pre}}$$

The normalized pre-payment poverty gap

This index is the weighted sum of the poverty gaps as a proportion of the poverty line. It shows the severity of poverty among the poor (Akazili, 2010). Also, it allows comparisons across countries with different poverty lines (O'Donnell et al., 2008). The normalized pre-payment poverty gap index is defined as:

$$NG_{pov}^{pre} = \frac{G_{pov}^{pre}}{Z_{pov}^{pre}}$$

Mean positive pre-payment poverty gap

This index measures the intensity of poverty. Its only includes the average poverty gap of the poor as a proportion of the poverty line. The mean positive gap is defined as:

$$MPG_{pov}^{pre} = \sum_{i=1}^{N} g_i^{pre} \Big/ \sum_{i=1}^{N} p_i^{pre} = \mu_{g^{pre}} / \mu_{P^{pre}}$$

We therefore have

$$\mu_{g^{pre}} = \mu_{P^{pre}} . MPG_{pov}^{pre}$$

This means that the average (prepayment) poverty gap is equal to the fraction of households who are poor (positive gap) multiplied by the average deficit of the poor (mean positive gap).

To obtain post-payment indices which is analogous to the pre-payment indices, we replace the pre-payment poverty line Z_{pov}^{pre} by the post-payment poverty line Z_{pov}^{post} and all other superscripts 'pre' by the superscript '$post$'.

Then poverty impact of out-of-pocket payment is defined as the difference between the relevant pre-payment and post-payment measures. This is written below:

Impoverishment head count is defined as:

$$PI^{H} = H_{pov}^{post} - H_{pov}^{pre}$$

Impoverishment gap is defined as:

$$PI^{G} = G_{pov}^{post} - G_{pov}^{pre}$$

Normalized impoverishment gap is defined as:

$$PI^{NG} = NG_{pov}^{post} - NG_{pov}^{pre}$$

While mean positive gap is defined as:

$$MPG^{NG} = MPG_{pov}^{post} - MPG_{pov}^{pre}$$

d. Factors associated with incurring catastrophic and impoverishing payments

Factors associated with a household incurring catastrophic payments and impoverishment shall be determined using multivariate logistic regression adapted from O'Donnell et al., (2005) and Knaul et al., (2007).

Model Specification: The logistic model that shall be used is as follows:

$$In\left[\frac{\pi(x)}{1-\pi(x)}\right] = \alpha + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_i x_i$$

Where $\pi(x)$ is the probability that the response variable (catastrophic payment or impoverishment) $Y_i = 1$; α is the constant and β are the coefficient of the predictor variables (χ). The independent variables shall include; location, education, socio-economic status, sex of household head, use of facility and out-of-pocket payment.

1.7 Poverty line

When assessing the impoverishing effect of out-of-pocket payments, a poverty line has to be applied (O'Donnell et al., 2008). A poverty line is defined as the value of consumption necessary to satisfy minimum subsistence needs (Akazili, 2010). Poverty can either be relative or absolute. Relative poverty lines express poverty in relation to a percentage of mean or median consumption in a country, while the absolute poverty line expresses poverty with respect to the absolute amount of consumption/money per capita required to meet minimum subsistence needs (Wagstaff et al., 2011). Two absolute poverty lines shall be applied in the study, and these are the national (Swazi) and international poverty lines. The national poverty line stands at E461.00 which is equal to US$ 97.46 in 2010 power parity purchasing (PPP) terms. The international poverty line was established by the World Bank and it is $1.25 per capita/day. This is equivalent to E5.91 in 2010 PPP terms. Worth noting is that the poverty lines shall then be annualised as the study time reference is one year.

1.8 Research Ethics

This study shall use secondary household survey data. Therefore, no significant ethical concerns pertaining to participants exist. However, ethics approval shall be obtained from the Human Research Ethical Committee (HREC) of the University of Cape Town before conducting the study.

1.9 Dissemination

The study findings shall be disseminated through publications. Two publications based on the study findings were prepared as partial fulfilment of the Masters in Public Health specialising in Health Economics. These include a journal article and a policy brief. The journal article shall be submitted to a peer-reviewed journal for publication.

1.10 References

Abu-Zaineh, M., Romdhane, H.B., Ventelou, B., Moatti, J. & Chokri, A. 2013. Appraising financial protection in health: the case of Tunisia. *International Journal of Health Care Finance and Economics.* 13(1):73-93. DOI:10.1007/s10754-013-9123-8.

Akazili, J. 2010. Equity in health care financing in Ghana. PhD. Thesis. University of Cape Town.

Akinkugbe, O., Chama-Chiliba, C. & Tlotlego*, N. 2012. Health Financing and Catastrophic Payments for Health Care: Evidence from Household-level Survey Data in Botswana and Lesotho. *African Development Review.* 24(4):358-370. DOI:10.1111/1467-8268.12006.

Arsenijevic, J., Pavlova, M. & Groot, W. 2013. Measuring the catastrophic and impoverishing effect of household health care spending in Serbia. *Social Science & Medicine.* 78:17-25. DOI:10.1016/j.socscimed.2012.11.014.

Ataguba, J.E. 2012. Reassessing catastrophic health-care payments with a Nigerian case study. *Health Economics, Policy and Law.* 7(03):309-326. DOI:10.1017/S1744133110000356.

Ataguba, J.E. & McIntyre, D. 2012. Paying for and receiving benefits from health services in South Africa: is the health system equitable? *Health Policy and Planning.* 27:i35-i45. DOI:10.1093/heapol/czs005.

Ataguba, J.E. & McIntyre, D. 2013. Who benefits from health services in South Africa? *Health Economics, Policy and Law.* 8(01):21-46. DOI:10.1017/S1744133112000060.

Barros, A.J.D., Bastos, J.L. & Damaso, A.H. 2011. Catastrophic spending on health care in Brazil: private health insurance does not seem to be the solution. *Cadernos De Saude Publica.* 27:S254-S262. DOI:doi.org/10.1590/S0102-311X2011001400012.

Brearly, L., Marten, R. & O'Connell, T. 2013. Universal health coverage: a commitment to close the gap. *New York: Rockefeller Foundation, Save the Children, the United Nations Children's Fund (UNICEF) and the World Health Organization.*

Bredenkamp, C., Mendola, M. & Gragnolati, M. 2011. Catastrophic and impoverishing effects of health expenditure: new evidence from the Western Balkans. *Health Policy and Planning.* 26(4):349-356. DOI:10.1093/heapol/czq070.

Brinda, E.M., Rodriguez, A.A. & Enemark, U. 2014. Correlates of out-of-pocket and catastrophic health expenditures in Tanzania: results from a national household survey. *BMC International Health & Human Rights.* 14(1):1-15. DOI:10.1186/1472-698X-14-5.

Castillo-Riquelme, M., McIntyre, D. & Barnes, K. 2008. Household burden of malaria in South Africa and Mozambique: is there a catastrophic impact? *Tropical Medicine & International Health.* 13(1):108-122. DOI:10.1111/j.1365-3156.2007.01979.x.

Chuma, J. & Maina, T. 2012. Catastrophic health care spending and impoverishment in Kenya. *BMC Health Services Research.* 12(3):1-9. DOI:10.1186/1472-6963-12-413.

Crystal, S., Johnson, R., Harman, J., Sambamoorthi, U. & Kumar, R. 2000. Out-of-pocket health care costs among older Americans. *Journals of Gerontology Series B-Psychological Sciences and Social Sciences.* 55(1):S51-S62. DOI:doi: 10.1093/geronb/55.1.S51.

CSO 2011. *Poverty in a decade of slow economic growth: Swaziland in the 2000's.* Swaziland: Central Statistical Office.

CSO 2015. *Central Statistical Office of Swaziland.* Available: http://www.swazistats.org.sz/ [2015,July,16].

Dercon, S. 2005. Risk, poverty and vulnerability in Africa. *Journal of African Economies.* 14(4):483-488.

Ekman, B. 2007. Catastrophic health payments and health insurance: Some counterintuitive evidence from one low-income country. *Health Policy.* 83(2–3):304-313. DOI:http://dx.doi.org/10.1016/j.healthpol.2007.02.004.

Flores, G., Krishnakumar, J., O'Donnell, O. & Van Doorslaer, E. 2008. Coping with Health-Care Costs: Implications for the Measurement of Catastrophic Expenditures and Poverty. *Health Economics.* 17(12):1393-1412. DOI:10.1002/hec.1338.

Gertler, P. & Gruber, J. 1997. *Insuring consumption against illness.* (6035). Cambridge: National Bureau of Economic Research.

Goudge, J., Russell, S., Gilson, L., Molyneux, C. & Hanson, K. 2009. Household experiences of ill-health and risk protection mechanisms. *Journal of International Development.* 21(2):159-168.

Grossman, M. 2000. The human capital model. *Handbook of Health Economics.* 1:347-408.

Habibov, N. 2009. What determines healthcare utilization and related out-of-pocket expenditures in Tajikistan? Lessons from a national survey. *International Journal of Public Health.* 54(4):260-266. DOI:10.1007/s00038-009-8044-2.

Haughton, J.H. & Khandker, S.R. 2009. *Handbook on poverty and inequality.* Washington DC, USA: World Bank Publications.

Horstman, R. 2007. *Can we predict out-of-pocket expenditures on HIV/AIDS on the basis of macro indicators? Evidence from the Latin American and Caribbean Region.* Netherlands: Netherlands Interdisciplinary Demographic Institute.

Hort, K., Goss, J., Hopkins, S. & Annear, P. 2010. *Conceptual frameworks, health financing data and assessing performance: A stock-take of tools for health financing analysis in the Asia-Pacific region.* (5). Australia: Nossal Institute for Global Health at the University of Melbourne.

Ichoku, H., Fonta, W. & Onwujekwe, O. 2009. Incidence and intensity of catastrophic healthcare financing and impoverishment due to out-of-pocket payments in southeast Nigeria. *Journal of Insurance and Risk Management.* 4(4):47-59.

Ilunga-Iunga, F., Leveque, A., Laokri, S. & Dramaix, M. 2015. Incidence of catastrophic health expenditures for households: An example of medical attention for the treatment of severe childhood malaria in Kinshasa reference hospitals, Democratic Republic of Congo. *Journal of Infection and Public Health.* 8(2):136-144. DOI:10.1016/j.jiph.2014.08.008.

Jones, A. 2006. *Applied Econometrics for Health Economics.* 2nd ed. United Kingdom: Department of Economics and Related Studies, University of York.

Knaul, F.M., Arreola-Ornelas, H., Méndez-Carniado, O. & Torres, A.C. 2007. Impoverishing and catastrophic household health spending among families with older adults in Mexico: A health reform priority. In *The Health of Aging Hispanics.* Springer. 237-262.

Knaul, F.,Marie, Wong, R., Arreola-Ornelas, H., Mendez, O. & Network Hlth Financing Social 2011. Household catastrophic health expenditures: A comparative analysis of twelve Latin American and Caribbean Countries. *Salud Publica De Mexico.* 53:S85-S95.

Kwesiga, B. 2012. Financial protection in Uganda's health system catastrophic and impoverishment effects of out-of-pocket health care payments. *Masters Thesis, University of Cape Town.*

Kwesiga, B., Zikusooka, C.M. & Ataguba, J.E. 2015. Assessing catastrophic and impoverishing effects of health care payments in Uganda. *BMC Health Services Research.* 15(1):30.

Leive, A. & Xu, K. 2008. Coping with out-of-pocket health payments: empirical evidence from 15 African countries. *Bulletin of the World Health Organization.* 86(11):849-856C.

Limwattananon, S., Neelsen, S., O'Donnell, O., Prakongsai, P., Tangcharoensathien, V., van Doorslaer, E. & Vongmongkol, V. 2015. Universal coverage with supply-side reform: The impact on medical expenditure risk and utilization in Thailand. *Journal of Public Economics.* 121:79-94. DOI:10.1016/j.jpubeco.2014.11.012.

Mankiw, N.G. 2011. *Principles of Microeconomics.* 6th ed. United State of America: Cengage Learning.

Maredza, M. 2009. Economic consequences for households of illness and of paying for health care in Zimbabwe: A case study . Masters in Public Health (Health Economics). University of Cape Town.

Mathauer, I., Musango, L., Carrin, G. & Mthethwa, K. 2008. *Feasibility assessment and financial projection results for a Social Health Insurance Scheme in Swaziland.* Geneva: World Health Organisation.

McIntyre, D. & Meheus, F. 2014. *Fiscal Space for Domestic Funding of Health and Other Social Services.* Available: http://www.chathamhouse.org/sites/files/chathamhouse/home/chatham/public_html/sites/default/files/20140300DomesticFundingHealthMcIntyreMeheus.pdf [2014, November 18].

McIntyre, D. 2007. *Learning from experience: Health care financing in low-and middle-income countries.* Geneva, Switzerland: Global forum for health research Geneva.

McIntyre, D. 2010. WHR 2000 to WHR 2010: what progress in health care financing? *Health Policy and Planning.* 25(5):349-351. DOI:10.1093/heapol/czq033 [doi].

McIntyre, D. & Meheus, F. 2013. Achieving sustainable universal health coverage in low- and middle-income countries. *Health Economics, Policy, and Law.* 8(4):543-548. DOI:10.1017/S1744133113000303 [doi].

McIntyre, D., Thiede, M., Dahlgren, G. & Whitehead, M. 2006. What are the economic consequences for households of illness and of paying for health care in low- and middle-income country contexts? *Social Science & Medicine.* 62(4):858-865. DOI:http://dx.doi.org.ezproxy.uct.ac.za/10.1016/j.socscimed.2005.07.001.

Mills, A., Ataguba, J.E., Akazili, J., Borghi, J., Garshong, B., Makawia, S., Mtei, G., Harris, B. et al. 2012. Equity in financing and use of health care in Ghana, South Africa, and Tanzania: implications for paths to universal coverage. *The Lancet.* 380(9837):126-133. DOI:http://dx.doi.org/10.1016/S0140-6736(12)60357-2.

Moreno-Serra, R., Millett, C. & Smith, P.C. 2011. Towards improved measurement of financial protection in health. *PLoS Medicine.* 8(9):e1001087.

Narci, H.O., Sahin, I. & Yuldirm, H.H. 2015. Financial catastrophe and poverty impacts of out-of-pocket health payments in Turkey. *European Journal of Health Economics.* 16(3):255-270. DOI:10.1007/s10198-014-0570-z.

Nguyen, H.T.H., Rajkotia, Y. & Wang, H. 2011. The financial protection effect of Ghana National Health Insurance Scheme: evidence from a study in two rural districts. *International Journal for Equity in Health.* 10:4. DOI:10.1186/1475-9276-10-4.

O'Donnell, O., van Doorslaer, E., Rannan-Eliya, R.P., Somanathan, A., Garg, C.C., Hanvoravongchai, P., Huq, M.N., Karan, A. et al. 2005. Explaining the incidence of catastrophic expenditures on health care: Comparative Evidence from Asia. *EQUITAP Project.* Working paper.

O'Donnell, O., van Doorslaer, E., Rannan-Eliya, R.P., Somanathan, A., Adhikari, S.R., Akkazieva, B., Harbianto, D., Garg, C.C. et al. 2008. Who pays for health care in Asia? *Journal of Health Economics.* 27(2):460-475. DOI:http://dx.doi.org.ezproxy.uct.ac.za/10.1016/j.jhealeco.2007.08.005.

O'Donnell, O., Wagstaff, A., van Doorslaer, E. & Lindelow, M. 2008. *Analyzing health equity using household survey data: a guide to techniques and their implementation.* Washington DC: World Bank Publications.

Onoka, C.A., Onwujekwe, O.E., Hanson, K. & Uzochukwu, B.S. 2011. Examining catastrophic health expenditures at variable thresholds using household consumption expenditure diaries. *Tropical Medicine & International Health.* 16(10):1334-1341. DOI:10.1111/j.1365-3156.2011.02836.x.

Onwujekwe, O., Hanson, K. & Uzochukwu, B. 2012. Examining Inequities in Incidence of Catastrophic Health Expenditures on Different Healthcare Services and Health Facilities in Nigeria. *Plos One.* 7(7):e40811. DOI:10.1371/journal.pone.0040811.

Ruhweza, M., Baine, S., Onama, V., Basaza, V. & Pariyo, G. 2009. Financial risks associated with healthcare consumption in Jinja, Uganda. *African Health Sciences.* 9(2).

Russell, S. 2004. The economic burden of illness for households in developing countries: a review of studies focusing on malaria, tuberculosis, and human immunodeficiency virus/acquired immunodeficiency syndrome. *The American Journal of Tropical Medicine and Hygiene.* 71(2 Suppl):147-155. DOI:71/2_suppl/147 [pii].

Saksena, P., Xu, K. & Durairaj, V. 2010. *The drivers of catastrophic expenditure: outpatient services, hospitalization or medicines.* (21). Geneva: World Health Organization.

Saksena, P., Antunes, A.F., Xu, K., Musango, L. & Carrin, G. 2011. Mutual health insurance in Rwanda: Evidence on access to care and financial risk protection. *Health Policy.* 99(3):203-209. DOI:10.1016/j.healthpol.2010.09.009.

Saksena, P., Smith, T. & Tediosi, F. 2014. Inputs for universal health coverage: a methodological contribution to finding proxy indicators for financial hardship due to health expenditure. *BMC Health Services Research.* 14(1):577-587. DOI:10.1186/s12913-014-0577-2.

Sambo, L.G. & Kirigia, J.M. 2014. Investing in health systems for universal health coverage in Africa. *Bmc International Health and Human Rights.* 14:28. DOI:10.1186/s12914-014-0028-5.

Sambo, L.G., Kirigia, J.M. & Orem, J.N. 2013. Health financing in the African Region: 2000-2009 data analysis. *International Archives of Medicine.* 6(1):10. DOI:10.1186/1755-7682-6-10.

Séne, L.M. & Cissé, M. 2015. Catastrophic out-of-pocket payments for health and poverty nexus: evidence from Senegal. *International Journal of Health Economics and Management.* :1-22. DOI:10.1007/s10754-015-9170-4.

Somkotra, T. & Lagrada, L.P. 2009. Which households are at risk of catastrophic health spending: experience in Thailand after universal coverage. *Health Affairs (Project Hope).* 28(3):w467-w478. DOI:10.1377/hlthaff.28.3.w467.

Su, T.T., Kouyaté, B. & Flessa, S. 2006. Catastrophic household expenditure for health care in a low-income society: a study from Nouna District, Burkina Faso. *Bulletin of the World Health Organization.* 84(1):21-27. DOI:doi.org/10.1590/S0042-96862006000100010.

Ukwaja, K.N., Alobu, I., Abimbola, S. & Hopewell, P.C. 2013. Household catastrophic payments for tuberculosis care in Nigeria: incidence, determinants, and policy implications for universal health coverage. *Infecteous Disease of Poverty.* 2(1):21. DOI:doi: 10.1186/2049-9957-2-21.

van Doorslaer, E., O'Donnell, O., Rannan-Eliya, R.P., Somanathan, A., Adhikari, S.R., Garg, C.C., Harbianto, D., Herrin, A.N. et al. 2006. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. *The Lancet.* 368(9544):1357-1364. DOI:http://dx.doi.org/10.1016/S0140-6736(06)69560-3.

van Doorslaer, E., O'Donnell, O., Rannan-Eliya, R.P., Somanathan, A., Adhikari, S.R., Garg, C.C., Harbianto, D., Herrin, A.N. et al. 2007. Catastrophic payments for health care in Asia. *Health Economics.* 16(11):1159-1184. DOI:10.1002/hec.1209.

Van Minh, H., Kim Phuong, N.T., Saksena, P., James, C.D. & Xu, K. 2013. Financial burden of household out-of pocket health expenditure in Viet Nam: Findings from the National Living Standard Survey 2002–2010. *Social Science & Medicine.* 96(0):258-263. DOI:http://dx.doi.org/10.1016/j.socscimed.2012.11.028.

Vyas, S. & Kumaranayake, L. 2006. Constructing socio-economic status indices: how to use principal components analysis. *Health Policy and Planning.* 21(6):459-468. DOI:10.1093/heapol/czl029.

Wagner, A.K., Graves, A.J., Reiss, S.K., LeCates, R., Zhang, F. & Ross-Degnan, D. 2011. Access to care and medicines, burden of health care expenditures, and risk protection: Results from the World Health Survey. *Health Policy.* 100(2-3):151-158. DOI:10.1016/j.healthpol.2010.08.004.

Wagstaff, A. 2001. *Measuring equity in health care financing: Reflections on and alternatives to the World Health Organization's Fairness of Financing Index.* World Bank Publications.

Wagstaff, A. 2002. Poverty and health sector inequalities. *Bulletin of the World Health Organization.* 80(2):97-105.

Wagstaff, A., Bilger, M., Sajaia, Z. & Lokshin, M. 2011. *Health Protection and Financial Protection.* Washington, D.C.: The World Bank.

Wagstaff, A. & Van Doorslaer, E. 2000. Equity in health care finance and delivery. In *Handbook of Health Economics.* A. Culyer & J. Newhouse, Eds. 1st ed. Amsterdam: Elsevier. 1803-1862.

Wagstaff, A. & van Doorslaer, E. 2003. Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998. *Health Economics.* 12(11):921-933.

Whitehead, M., Dahlgren, G. & Evans, T. 2001. Equity and health sector reforms: can low-income countries escape the medical poverty trap? *The Lancet.* 358(9284):833-836. DOI:http://dx.doi.org/10.1016/S0140-6736(01)05975-X.

WHO 2010. *The world health report. health system financing.the path to unniversal health.* Geneva: WHO Press.

WHO 2013. *State of Health Financing in the African Region.* Brazzaville,Congo: World Health Organization regional office for Africa.

WHO 2015a. *African Health Ministers Reaffirm their Commitnent to make the Continent Healthy. Luanda Declaration adopted

.* Available: http://www.afro.who.int/en/media-centre/pressreleases/item/6483-african-health-ministers-reaffirm-their-commitment-to-make-the-continent-healthy-luanda-declaration-adopted.html [2015, August 2].

WHO 2015b. *National Health Accounts Database.* Geneva, Switzerland: World Health Organisation.

WHR. 2000. *World Health Report.* Geneva,Switzerland: World Health Organization.

Wyszewianski, L. 1986. Families with Catastrophic Health-Care Expenditures. *Health Services Research.* 21(5):617-634.

Xu, K. 2005. *Distribution of health payments and catastrophic expenditures Methodology.* (2). Switzerland, Geneva: World Health Organization.

Xu, K., Evans, D.B., Kadama, P., Nabyonga, J., Ogwal, P.O., Nabukhonzo, P. & Aguilar, A.M. 2006. Understanding the impact of eliminating user fees: utilization and catastrophic health expenditures in Uganda. *Social Science & Medicine.* 62(4):866-876.

Xu, K., Saksena, P., Jowett, M., Indikadahena, C., Kutzin, J. & Evans, D.B. 2010. *Exploring the thresholds of health expenditure for protection against financial risk.* (19). Geneva, Switzerland: World Health Organization.

Xu, K., Evans, D., Kawabata, K., Zeramdini, R., Klavus, J. & Murray, C. 2003. Household catastrophic health expenditure: a multicountry analysis. *Lancet.* 362(9378):111-117. DOI:10.1016/S0140-6736(03)13861-5.

Xu, K., Evans, D.B., Carrin, G., Aguilar-Rivera, A., Musgrove, P. & Evans, T. 2007. Protecting households from catastrophic health spending. *Health Affairs (Project Hope).* 26(4):972-983. DOI:DOI 10.1377/hlthaff.26.4.972.

Yardim, M.S., Cilingiroglu, N. & Yardim, N. 2010. Catastrophic health expenditure and impoverishment in Turkey. *Health Policy (Amsterdam, Netherlands).* 94(1):26-33. DOI:10.1016/j.healthpol.2009.08.006.

2 Part B: Literature Review

2.1 Introduction

This literature review aims to give a structured theoretical, methodological and empirical review (synthesised and critically appraised evidence found) of previous related work conducted with regard to the assessment of financial health protection.

2.2 Theoretical and methodological literature

The theoretical section aims to provide theoretical debates in relation to assessing financial protection in health. These will further inform the conceptual framework used in this study. The theoretical literature is divided into four parts: First, the financial burden of illness on households due to health payments; second, determinants of household vulnerability to financial risk; third, the role of health system financing and the role of out-of-pocket health care payments, and lastly the methods for assessing catastrophe and impoverishment.

2.2.1 Financial burden of illness on the household due to direct health payments

Health related shocks are assumed as the biggest threats to households' welfare and financial stability with the consequences worse among the poor (Gertler & Gruber, 1997). This is so because illness is unpredictable, yet it necessitates expenditures that households may be poorly equipped to deal with. This is the case especially with the poor that allocate a greater share of their income to basic necessities, like food (McIntyre et al., 2006; Wagstaff, 2002; Whitehead, Dahlgren & Evans, 2001; Wagstaff & Van Doorslaer, 2000). This suggests that the financial burden of illness is disproportionately more among poor households than the rich (McIntyre et al., 2006). Exacerbating this is the high disease burden among the poor compared to the rich. As a result, poor households are constantly faced with health shocks that eventually result in high expenditures and consequently displace spending on non-medical basic needs; a phenomena called the 'medical poverty trap' (Whitehead, Dahlgren & Evans, 2001).

This notion is consistent with the renowned Wagstaff-Grossman model of demand for health care. The theory posits that the cost of health care is reflected by the basic needs consumption foregone in order to spend on health care (Grossman, 2000). This has led to the assumptions that poverty and ill-health are interrelated and the association is multi-

directional, meaning that poverty is a predictor of ill-health and the reverse is true (WHO, 2010; Leive & Xu, 2008; McIntyre et al., 2006; Wagstaff, 2002; Whitehead, Dahlgren & Evans, 2001; Wagstaff & Van Doorslaer, 2000).

Further, it is believed that spending on health care is less of a choice (non-discretionary) (O'Donnell et al., 2008; Wagstaff, 2002; Whitehead, Dahlgren & Evans, 2001). However, this assumption is not without debate given that some households may prefer not to spend on health care to avoid incurring catastrophic expenditures (Flores et al., 2008). Nevertheless, in many cases, the poor would pay for health care in spite of their low ability to pay and consequently suffer the greatest (O'Donnell et al., 2008; Whitehead, Dahlgren & Evans, 2001).

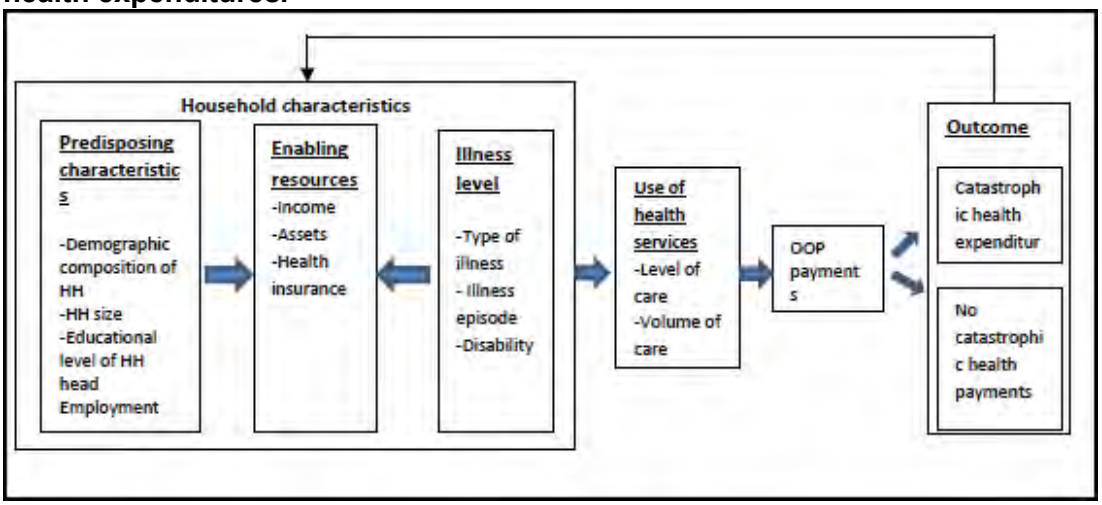
On the other hand, households do not only divert the income originally meant for spending on basic needs in order to meet health care costs but they also adopt coping mechanisms, such as the sale of productive assets and borrowing (McIntyre et al., 2006). However, these coping mechanisms are not sufficient to protect households' consumption against the illnesses related shocks, particularly those that are associated with hospitalisation and conditions that limit one's physical activity (Leive & Xu, 2008; Gertler & Gruber, 1997). Instead, they limit households' ability to cope with future health shocks by straining their income generating capacity (Leive & Xu, 2008; McIntyre et al., 2006; Gertler & Gruber, 1997). Thus there is a greater need to identify the most vulnerable groups to ensure their protection against financial risk associated with health care payments.

2.2.2 Determinants of household vulnerability to financial risk

Household vulnerability is the likelihood of a household facing risk that may cause its welfare to decline (Dercon, 2005). It is conjectured that certain groups and households have a greater propensity to suffer financial risks than others and thus, there is a need for policy interventions to not only seek to contain the health care costs, but also to protect the most 'at risk' groups. In order to achieve the latter, it would be necessary for policy makers to have knowledge about the determinants of households' vulnerability to financial risk.

Theoretical arguments on household vulnerability to financial risk appear to suggest that the level of out-of-pocket health care payment experienced is driven by type, quantity and the extent of third party coverage for the services consumed, as well as individuals' ability to pay (McIntyre, 2007; Xu et al., 2003; Crystal et al., 2000). In light of this view, factors that predict household vulnerability to financial risks can be thought of, in part, in terms of those predictive of health service utilisation (Crystal et al., 2000). Applying this concept, (Horstman, 2007), as cited in (Maredza, 2009) adapted the Andersen and Newman framework of health services utilisation to develop a conceptual framework for analysing determinants of catastrophic health expenditures. The framework constitutes of two factors whose interaction presumably triggers out-of-pocket payments whose consequences can either be catastrophic to households (i.e., increasing household vulnerability to financial risk) or not (Maredza, 2009). These factors are namely household characteristics and health services utilisation. (See figure 1).

Figure 1. Conceptual framework for analysing determinants of catastrophic health expenditures.



Adapted from Maredza (2009).

A brief summary of the two factors

The household characteristics

The household characteristics are divided into pre-disposing factors, enabling factors and illness level. Predisposing factors are those characteristics that increase the likelihood of a household's use of healthcare services and consequently incurring catastrophic health expenditures. The associated factors include: demographic

composition of the household, household size, household head educational level and employment status.

Enabling factors are the conditions or resources that enable households to respond to their health care needs. They are presumed to resemble households' ability to pay. They include households' income level, assets and whether the household has access to insurance or not. The last component of household characteristics is illness level and it includes the type of illness, illness episodes and the presence of a household member living with a disability.

The interaction between these characteristics also has a theoretical basis according to Grossman's human capital model of the demand for health care (Grossman, 2000). The model states that the demand for health capital is determined by the future wage rate, the marginal cost of investment in health and the future depreciation of health (Grossman, 2000). The model views health as a durable capital stock that yields an output of healthy times and individuals are born with an inherited stock of health which depreciates over time but can be increased with investments (such as, consumption of preventive medical care and healthy life styles). The model predicts that the 'shadow price' of health care rises with age if the rate of depreciation on the stock rises over the life cycle and falls with education. This theory posits that the elderly are more likely to suffer illness whilst the educated are efficient producers of health (leading a healthy life style and investing in preventative medicine). On the other hand, the model suggests that an increase in the shadow price may simultaneously reduce the quantity of health care demanded and increase the quantities of health inputs (health care) demanded (Grossman, 2000). In that case, a household with a member with chronic illness can be expected to consume more health care (inputs) and consequently incur more costs (Habibov, 2009).

On the other hand, education is associated with improved household welfare since it is associated with better earnings (Grossman, 2000). Hence education could be considered as an enabling factor for households to spend more on health care. This line of thought is consistent with the law of demand which predicts an increase in demand of services with an increase in income at least for normal goods (Mankiw, 2011) Thus, those households with more disposable income would be expected to demand more services than their poorer counterparts.

Health service use

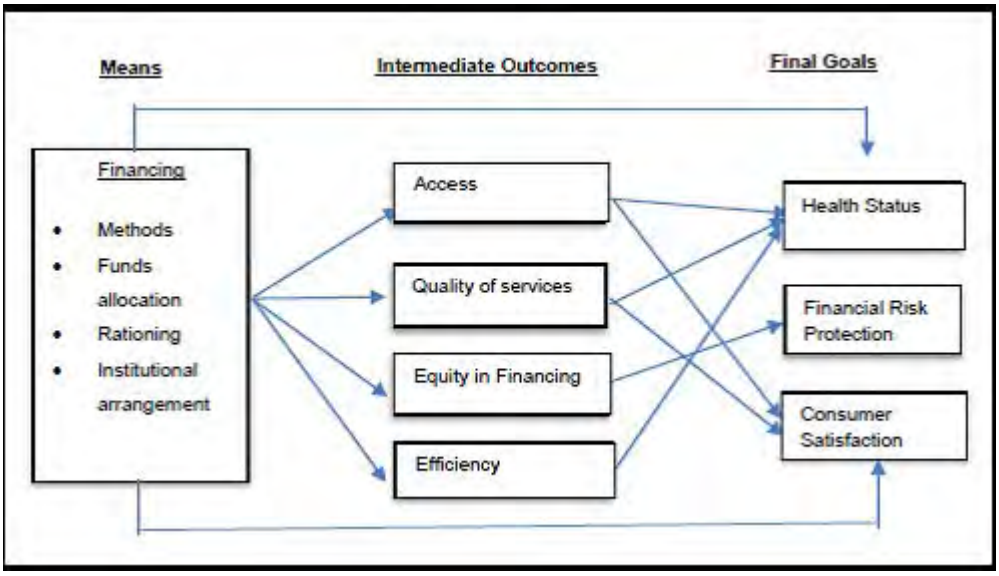
Most countries have their health services provision organised into three parts namely: primary, secondary and tertiary. The assumption is that the volume and costs of care tend to increase with the level of service (McIntyre, 2007). Therefore, households with individuals that require advanced care such as hospitalisation can be expected to face a higher risk of incurring catastrophic health expenditure than those consuming care at lower levels.

2.2.3 The role of health system financing

Health system financing is one of the six building blocks of the health system, with the other five being governance, information, service delivery, medical products and health work force (Hort et al., 2010). The role of health system financing in the attainment of financial health protection is perceived to be critical (WHO, 2010). A health system is defined as any organisation, people and actions whose primary intent is to promote and restore or maintain health (WHO, 2007). There are conceptual frameworks that have been developed to enhance understanding of the functions of the financing component of the health system and commonly used conceptual frameworks are those suggested by Hsiao (2003) and Kutzin (2001). Kutzin's framework is mainly descriptive of the health system financing functions of collecting revenue, pooling resources and purchasing services. Also, the framework appears to place an emphasis on prepayment mechanisms for maximum income and risk cross subsidisation (Hort et al., 2010).

On the other hand, Hsiao's conceptual framework is explicitly more analytical than descriptive and it modelled the role of health system financing function within the systemic aspect of the health system as a key element that determines the observed goals of the health system. (See Figure 2).

Figure 2. Relationship between financing instrument and goals



Adapted from Hort et al.,(2010)

Hsiao's framework postulates that financing is a policy instrument available to policy makers in order to achieve the health system's final goals (health status, financial protection and consumer satisfaction). Out-of-pocket payment is one of the mechanisms for financing health care. Others include tax based and pre-payment mechanisms (insurances) (McIntyre, 2007). Out of the three health care system financing mechanisms, out-of-pocket payment is the most regressive mechanism that does not offer cross-subsidisation between individuals of different income groups and illness (McIntyre, 2007). As such, the burden of health care payment remains solely on individuals and their households.

The concern is that, out-of-pocket payments displaces household spending on other basic necessities like food and further drive previously non-poor households into poverty and deepens poverty for those who were already poor (Wagstaff & van Doorslaer, 2003). There is a common take on the idea that if health care systems were to achieve financial health protection for their populations, out-of-pocket health care payments would need not be the major source of health care financing within countries, but prepayment mechanisms instead (WHO, 2010). This idea has incited the measurement of financial health protection among countries not only with the intention to know the level of financial health protection but also to inform health care policies aimed at improving financial health protection among countries.

2.2.4 Measurement of financial burden of out-of-pocket health care payments

The publication of the World Health Report [WHR] (2000) did not only detail the functions of the health system but it also gave assessment of financial health protection a centre stage. Furthermore, the report illustrated that the role of health systems was not only to ensure good health but also to protect households financially by ensuring fairness in health care financing. In the WHR, fairness was defined as having households contributing to health care financing according to ability to pay[6] (WHR., 2000). In an effort to promote assessment of the financial burden of out-of-pocket payments on households, the WHR proposed an index of fairness in health care financing called Fairness of Financial Contribution index (FFC). However, this index was never without criticisms as it was constructed from the premise that health payments ought to be proportional to ability to pay. This means that irrespective of where one sits on the income distribution range, they ought to contribute a similar proportion of their income to health care (Wagstaff, 2001). Also this index failed to discriminate between progressive, regressive and horizontally inequitable health financing. As such, this index is regarded as inadequate to measure fairness in health care financing, more so because it violates the principle of vertical equity[7]. This principle's fundamental objective is to reduce the welfare gaps post payment between the poor and the rich (Wagstaff, 2001). Those that subscribe to this notion believe that a measure of financial 'hurt' in the context of health financing should also recognise that the 'hurt' will vary by income level (Ataguba, 2012).

Most of the methodologies for assessing financial protection in health are based on the convectional Foster-Greer-Thorbecke (FGT) poverty indices and on the assumption that spending on health care is involuntary (non-discretionary) and household income is fixed (O'Donnell et al., 2008). However, these assumptions are not without debate. Some theorists argue that households' health care expenditure can be smoothed over by coping mechanisms adopted (Flores et al., 2008). Notwithstanding the latter argument, lots of debates around this subject appear to support this assumption under the argument

[6] Ability to pay is a measure of household total disposable income after spending on subsistence or non-medical basic necessities such as food and water.
[7] Vertical equity is a principle that involves unequal but equitable treatment of unequals or reducing welfare gaps between unequal individuals. So, in health financing, it demands that households of unequal ability to pay make appropriately dissimilar payments.

that health care is predicted to restore healthy days; a condition that is desirable to many regardless of income level (O'Donnell et al., 2008; Whitehead, Dahlgren & Evans, 2001). In assessing financial risk protection, methodologies measures the catastrophic and impoverishing effects of out-of-pocket health care payments on households (Wagstaff & van Doorslaer, 2003). In addition to the latter, there is also assessment of factors that are associated with households' vulnerability to financial risk (Somkotra & Lagrada, 2009; Xu et al., 2007; Xu et al., 2003).

2.2.5 Methodologies for assessing the financial burden of health care payments and associated risk factors

This section discusses the theoretical debates around the methods commonly used in assessing the burden of out-of-pocket health care payments on households and associated risk factors. The methods are namely: i) The catastrophic impacts of out-of-pocket health care payments; ii) The impoverishing effects of out-of-pocket health care payments; iii) Measurement of vulnerability to financial risk as a result of out-of-pocket health care payments.

The catastrophic impacts of out-of-pocket health care payments

In the assessment of catastrophic impact of out-of-pocket health payments, the concern is not about the absolute amount of out-of-pocket payment but rather the share of health payments made relative to the households' available resources (O'Donnell et al., 2008; Wagstaff & van Doorslaer, 2003). This is because it is hypothesised that even modest health care payments in absolute terms can be catastrophic depending on where one sits on the income distribution range (Ataguba, 2012). Out-of-pocket health care payments are regarded as catastrophic when they exceed a certain fraction or threshold of the household's living standard (income or total expenditure) in a given period which is usually a year (O'Donnell et al., 2008). The ethical concern here is that spending a large fraction of household income on health care will compromise household's ability to spend on other basic non-medical necessities, e.g., food, clothing and shelter (Wagstaff & van Doorslaer, 2003). According to O'Donnell et al., (2008), the extent to which households' living standards are seriously disrupted by out-of-pocket health care payments should be estimated using longitudinal data as this could allow for observation of the adverse consequences of out-of-pocket health care payments on households

overtime. However, in the event of the availability of cross-sectional data, approximation should be made (O'Donnell et al., 2008).

The catastrophic impact of out-of-pocket health payments could be defined either with respect to household income (or using total consumption expenditure as a proxy) or capacity to pay which is effective income remaining after basic subsistence needs have been met (O'Donnell et al., 2008; Wyszewianski, 1986). There are two key variables involved in the measurement of catastrophic expenditure namely, total household out-of-pocket health care payments (numerator) and a measure of household resources or living standards (denominator) (Wagstaff & van Doorslaer, 2003). In an event when total household expenditure is used as a denominator, catastrophic expenditure is defined with respect to health payments budget share (share of total expenditure), whereas in the case of capacity to pay, catastrophe is defined in relation to health payment as a share of total expenditure net spending on basic necessities (Wagstaff & van Doorslaer, 2003). It is important to note that traditionally, the threshold goes with the measure of household's living standard chosen, which is normally 10% if payments are defined as a budget share, and 40% in the case of capacity to pay (Wagstaff, 2003; O'Donnell et al., 2008). It is however, important to note that the thresholds are arbitrary in nature as they lack scientific bases and there is no consensus on a standard threshold yet, instead there has been a consensus that more than one thresholds levels should be reported and the selection decisions shall remain with the readers (O'Donnell et al., 2008; Xu et al., 2007). This is thought to reduce bias and guide decision-making in an informed manner.

While the capacity to pay approach is most preferred compared to income by most literature, there were reservations concerning its use, particularly on how and what to define as subsistence expenditure (Wagstaff & van Doorslaer, 2003). To address this challenge, studies have used total expenditure (income) net food spending to define capacity to pay (Wagstaff & van Doorslaer, 2003; Xu et al.,2003).

Overall, this methodology gives the extent and intensity of catastrophic out-of-pocket payments in a given sample of households which have been exposed to health payments and whose health care costs as a share of total (or non-food) expenditure exceeded the chosen threshold (Wagstaff, 2003). However, given the theory of justice and the wide concern for equity, it is believed that reporting the incidences of catastrophic health payments without showing how they vary across income distribution might be of less

value to society. Thus, some authors use the concentration index[8] to adjust the measures of financial catastrophe to account for whether the poor or rich face more financial catastrophe (Wagstaff, 2003). However, this methodology is limited in that the indices themselves are based on those categorised as making payments and it ignores those households, particularly the poor who could not afford health payments and consequently forego treatment (Wagstaff et al., 2011).

Unfortunately, this group is believed to suffer greater welfare loss than those incurring catastrophic payments (Wagstaff et al., 2011). Also, this methodology assumes that the threshold be constant across households of different living standards, a concept viewed similar to proportionality which violates the principle of vertical equity that underpins the notion of fair health financing (Ataguba, 2012). In this regard, some authors have suggested that subjecting households of different income levels to similar thresholds would be unfair and unethical and that catastrophe should rather be a function of where the household sits in the income distribution (Ataguba, 2012; Onoka et al., 2011).

However, the current methodologies for examining catastrophic health payment are informative of at least part of the catastrophic economic consequences of illness without identifying the extent to which catastrophic payments cause hardship among households. Thus there is a need to assess the impoverishing effects of out-of-pocket health care payments on households (O'Donnell et al., 2008; Wagstaff & van Doorslaer, 2003). This is so because catastrophic health payments can push previously non-poor households into poverty at the same time deepening the already poor further into poverty.

The impoverishing effects of out-of-pocket health care payment

In principle, no one ought to be pushed or deepened into poverty as a result of health care payments (Wagstaff & van Doorslaer,2003; WHO,2010). Health payments are deemed impoverishing if households' standard of living is lowered (pushed below the poverty line) and or the previously poor are made worse-off as a result of payments

[8] Concentration is a measure used to identify whether socioeconomic inequality in some health sector variable exists and whether it is more pronounced in one group or another.

(O'Donnell et al., 2008; Gertler & Gruber, 1997). An argument behind the assessment of the impoverishing effects of out-of-pocket health payment is that this form of impoverishment is not captured by the conventional approaches for measuring poverty which normally applies the standard poverty lines (Akazili, 2010). The conventional approaches compare total household expenditure to poverty lines that are normally not adjusted for health care costs (O'Donnell et al., 2008). This limitation applies even to higher poverty lines which are argued to have implicit allowance for the costs of health care, but because of the stochastic nature of households' health care need they are often deemed inadequate (Wagstaff et al., 2011; O'Donnell et al., 2008; van Doorslaer et al., 2006).

To assess the impoverishment effects of out-of-pocket payments, a local or international poverty line is used to compare households' living standard pre out-of-pocket payment and post out-of-pocket payment, such that any resultant increment in poverty headcounts post payment is the impoverishing effects of out-of-pocket health payments (Wagstaff & van Doorslaer, 2003). The international poverty lines recommended by the World Bank are $1.25/day and $2 day at Purchasing Power Parity dollar values of 2005 (Wagstaff et al., 2011).

While this methodology gives the extent (impoverishment headcount) and intensity (impoverishment gap) of poverty caused by health care payments, it does not provide information on households' vulnerability to financial hardship (Wagstaff & van Doorslaer 2003). Thus, there is a need to assess household factors that are associated with financial risk in order for policy makers to target the most at risk groups (Knaul et al., 2007).

Measurement of vulnerability to financial risk as a result of out-of-pocket health care payment

In assessing household vulnerability to financial risk the binary response models (i.e., logit and probit) have been commonly applied by many studies. The logit and probit models assume that there is some continuous latent variable y* that determines participation (incurring catastrophic expenditure), so y* can be viewed as the households'

propensity to incur catastrophic health expenditure. The logit and probit models are estimated by the method of maximum likelihood estimation[9] (Jones, 2006).

Previous work have looked at both household characteristics and the use of health services (level of care and volume) in assessing the factors associated with households' vulnerability to financial risk as a result of out-of-pocket health care payments. The households' characteristics include household size and composition, household health insurance status and household-head (educational, sex and employment) statuses (Saksena, Smith & Tediosi, 2014; Knaul et al., 2011; O'Donnell et al., 2005). It is however, important to note that the literature also indicated that there has been empirical work conducted previously on factors outside the household level such as health system financing (Wagner et al., 2011; Xu et al., 2007; Xu et al., 2003).

2.3 Empirical review

Literature search strategy

Keywords: catastrophe, catastrophe, impoverishment, out-of-pocket; financial; assessment; determinants; factors and correlates.

A search of keywords was conducted on electronic databases namely; Africa-Wide Information, Medline, Academic Search Premier via EBSCOhost and Web of Sciences (core collection and all data bases separately) and lastly Google Scholar. The keywords were combined with common terms around the topic (such as; household, costs, risk, burden, poverty, health care and payment) using Boolean operators "AND and OR".

Abstracts of identified studies were read and the full texts of relevant documents were retrieved for inclusion in the review. Also, reference lists of retrieved studies were further searched to identify additional relevant publications. The databases search was supplemented by a search of relevant organisational websites and the use of grey literature such as theses that were deemed related to the topic understudy.

[9] Maximum likelihood estimation is a method of estimation that specifies the joint probability of the observed set of data and finds the parameter values that maximize it.

The visited organisational websites are namely:

http://www.who.int

http://www.worldbank.org

Inclusion and exclusion criteria

The inclusion criteria were specified according to the objective of the study, which is to assess the catastrophic and impoverishing effects of out-of-pocket health payment and the associated factors. For a document to be included, it needed to have applied theoretically and scientifically sound methodologies for determining the following; catastrophic health expenditure, impoverishment effects out-of-pocket payments and determinants or risk factors associated with households facing financial risk.

Only studies written in English language were included in the review. Also, they must have been conducted using nationally representative surveys. However, studies conducted in Africa meeting these criteria were limited. As a result, there were a few studies from Africa that did not use a nationally representative survey but were considered. Their inclusion was relevant in order to provide some evidence from Africa on financial risk protection. Most of these studies looked at financial risk protection in relation to specific diseases (e.g., TB and Malaria).

Altogether, a total number of 38 studies were reviewed, and, of these studies 29, 15 and 20 looked at catastrophic expenditure, impoverishment and associated factors respectively. It is important to note that some studies focused on all the sub-topics at once while others examined either one or two of the sub-sections (catastrophe, impoverishment and risk factors).

While there was no country restriction applied in the search, apart from the multi-country studies, all other studies were intentionally abstracted from low and middle income countries mostly from Asia, Africa and Latin America. This is because low and middle income countries were considered most relevant considering that Swaziland is ranked as a lower-middle income country.

A summary of the findings and characteristics for each study reviewed is presented according to the three sub-sections in the following manner; empirical work for assessing catastrophe, impoverishment and associated factors.

2.3.1 Studies assessing the catastrophic impact of health care payments

Brief summary of the reviewed evidence

Studies reviewed were found to have employed observational study designs, namely cross-sectional studies. The studies may be divided into three main categories namely; cross-country, individual country and disease specific. The countries considered in the cross-country studies differed in many respects e.g., income level, region, epidemiological and demographic trends.

The methodology proposed by Wagstaff & van Doorslaer (2003) and that by Xu et al (2003) received wider application by most studies reviewed. The Wagstaff and van Doorslaer (2003) methodology proposes assessing catastrophic out-of-pocket payments in relation to total or non-subsistence household (consumption/income) expenditure against a predetermined threshold level of 10% or 40% in a case of total and total non-food expenditure respectively. Worth noting is that, this methodology simple takes the amount spent on food without necessarily considering if that particular amount spent meets the minimum calorie intake for the households. On the other hand, the methodology by Xu et al., (2003), uses the total non-food approach (thresholds level of 40%) similar to that of Wagstaff & van Doorslaer (2003), but, it further proposes deduction of a fixed food allowance across all households regardless of the reported amount (Xu, 2005). This method also has its own limitation in that, some households are likely to have a negative residual following the deduction of the allowance.

However, it is important to note that studies using the latter methodologies employed a wide range of threshold levels ranging from 2.5% by Wagstaff & van Doorslaer (2003) to 60% by Kouyate & Flessa (2006). This was consistent with O'Donnell's (2008) recommendation to present results from a wide range of thresholds in order to enhance informed decision making.

On the other hand, the incidence of catastrophic expenditure was higher among lower threshold levels, with a tendency to decline with increasing threshold levels (Kwesiga, Zikusooka & Ataguba, 2015; Ilunga-Iunga et al., 2015; Ataguba, 2012; Chuma & Maina, 2012; Onoka et al., 2011; Akazili, 2010).This indicated that the extent of catastrophic health expenditure among poor households is likely to be missed with use of higher threshold levels alone (Arsenijevic, Pavlova & Groot, 2013; O'Donnell et al., 2008).

In addition to assessing the extent, a few studies further examined the catastrophic payment gap, mean positive gap, distribution of catastrophe with income and ranked weighted measures (Séne & Cissé, 2015; Ataguba, 2012; Chuma & Maina, 2012; Wagstaff & van Doorslaer, 2003). Both weighted and un-weighted measures declined with increasing threshold levels and the weighted measures were higher than un-weighted measures whenever catastrophic payments were concentrated among households in the lower expenditure quintile. This observation explicitly implies that the burden of health care payment was more among poor households compared to their better-off counterparts (O'Donnell et al., 2008). (Table 1, presents a summary of the studies reviewed).

Table 1. Studies assessing the catastrophic effect of health care expenditure

Study Author (year)	Country	Study design, year & country	What constituted out-of-pocket payments (OOP)	Method/living standard measures	Findings ,explanation and conclusion
Akazili, (2012)	Ghana	National survey.	Direct payments[10] made to health providers excluding insurance reimbursements.	Adapted the methodology by Wagstaff & van Doorslaer (2003). Catastrophic health expenditure (CHE) was defined in terms of total and non-food consumption expenditure. Household (HH) socio-economic status (SES) was estimated using consumption expenditure. Threshold levels applied were 5% and 40%.	In the case of total expenditure about 11% and 5% HHs experienced CHE at the 5% and the10% threshold levels respectively. Whereas in the non-food expenditure approach about 11% and 2% HHs experienced CHE at the 10% and the 40% thresholds respectively. In both approaches the incidence of CHE declines with rising threshold.
Akinkugbe, Chiliba & Tlotlego (2012)	Botswana Lesotho	National survey ,*Household and*	Costs for health care services and appliances not	Adopted Xu et al., (2003) methodology.	In Botswana the levels of CHE at the 20% and the 40% threshold levels were estimated at 11% and 7% respectively.

[10] Out-of-pocket payment made at the point of service.

		Expenditure Survey and Household Budget Survey (2002/2003).	reimbursed by insurances.	CHE was defined in terms of total non-food consumption expenditure. Consumption was the measure of HH SES. Threshold applied were the 20% and 40%.	While Lesotho at the same thresholds levels (20% and 40%), reported about 3.22% and 1.25 % respectively. Both countries at the 40% threshold level, the incidence of CHE declined with increasing income. Also, in Lesotho the level of CHE was concentrated amongst middle income groups and less so in Botswana which was mainly concentrated amongst the lowest income quintile.
Arsenijevic, Pavlova & Groot, (2013)	Serbia	National survey, (*Living Standard Measurement Stud*y-(LSMS). (2007)	Direct costs of health care that were not reimbursed.	Adapted Wagstaff & van Doorslaer (2003) methodology. Used both income and consumption as measures of HH SES. CHE was defined both as a share of total income and consumption expenditure. Thresholds applied include 10%, 20%, 30%, and 40%.	The overall indices obtained by the income-based measures tend to be higher than the consumption-based indices but less so at <10 % threshold levels. The overall incidence of CHE at the 40% threshold level for both income and consumption approaches was 0.8% and 2.3% respectively. In the case of poverty measures, those in the poorest quintile appeared to suffer the greatest compared to other quintile groups particularly in the income-based approach.

Ataguba, (2012)	Nigeria	National survey, (*National Living Standards*,) (2003/2004)	Direct costs faced by households in using health services excluding transport costs and those covered by health insurance.	Modified Wagstaff & van Doorslaer (2003) methodology and applied an aversion parameter to develop rank dependent thresholds. Both uniformed and variable thresholds were applied for comparability. CHE was defined in terms of total (non-food) expenditure. Thresholds applied for total expenditure 10%, 15% and 20% while 20%, 30% and 40% threshold levels were used for the total non-food expenditure.	*Headcount incidence with the total expenditure approach*: The rank-dependent head count decreased with increasing values of the aversion parameter used and also with increasing threshold levels. The incidence of CHE was concentrated among poor households. A mixed picture was reported with the mean catastrophic gap as some gap measures increased with increasing values of the parameter while this was not entirely the case with others. *Headcount with the total non-food expenditure approach*: Findings had a similar pattern to those observed in the total expenditure-based measures. Worth noting is that, all measures based on variable thresholds were higher than those obtained using the uniformed threshold.
Bredenkamp, Mendola & Gragnolati, (2011)	Albania; Bosnia and Herzegovina; Montenegro;	National surveys. *(Living Standards and Measurement*	Direct payments made to health care providers	Applied the Wagstaff & van Doorslaer (2003), methodology. A measure of HH SES was based on	Both incidence and intensity of catastrophe were higher at lower thresholds and, in all cases the mean positive gap increased with increasing threshold levels.

	Serbia and Kosovo.	*Surveys or any equivalent*). (2000–2005)	including costs for drugs.	total non-health income expenditure.	Montenegro reported the least measurements compared to the four countries for all thresholds levels while Albania and Kosovo were the worst. At the 10% threshold level, Albania, Bosnia, Serbia and Kosovo recorded catastrophe headcount of about 20.8%, 3.1%, 1.4%, 12.2%, and 26.3% respectively.
Castillo-Riquelme et al.,2008	South Africa and Mozambique	District survey (2001-2002)	Direct and indirect costs of accessing care.	Adapted methodology proposed by Xu et al (2003). An asset index was used to estimate HH SES. CHE was defined as out-of-pocket payments exceeding threshold of 10% of monthly income and 40% total expenditure.	At the 10% threshold, the level of CHE in Mozambique was estimated at 42.4% while South Africa reported about 7.9% and 7.5% in two different provinces. At the 40% threshold level, Mozambique recorded higher levels of CHE compared to South Africa reporting 39.1% compared to 7.1% and 9.4% by South African regions.
Chuma & Maina (2012)	Kenya	National survey, (*Health expenditure and utilization survey).* (2007)	All non-reimbursed direct payments made to health care providers (including drugs costs).	Adapted Wagstaff & van Doorslaer (2003), methodology. Also presented weighted indices (headcount and intensity). CHE was defined in terms of both total and non-subsistence consumption expenditure.	The incidence and intensity of CHE were inversely proportional to income in both expenditure share approaches and all threshold levels applied. The poor suffer the greatest.

				Used consumption as a measure of HH's socioeconomic status (SES). Thresholds applied:10, 30 & 40%	The weighted indices tend to be higher than the un-weighted indices across thresholds and income level. The indices by non-food expenditure share were higher than those observed by the total expenditure measure in general.
Flores et al., (2008)	India	National survey (1995–1996)	Direct payments made for health services.	Adapted Wagstaff & van Doorslaer (2003), methodology. They also accounted for financial coping strategies. HH SES was estimated using HH expenditure and consumption. Threshold levels applied: 5%, 10%, and 20%.	The incidence for CHE was generally higher at lower threshold levels in both the adjusted and unadjusted measures. Also, the adjusted measures were significantly smaller compared to the unadjusted, measures. (*This indicated the HHs' ability to smooth consumption in an event of health shocks*) *For unadjusted*: at the 5%, 10% and 20% threshold levels the incidence of CHE was 3.4%, 2.2% and 1% respectively for rural, whilst for urban the incidence was about 4%, 2.4% and 1% respectively at similar thresholds levels. *For adjusted*: at the 5%, 10% and 20% the incidence of CHE was 0.52%, 0.21% and 0.04% for rural while for urban it was about

					0.83%, 0.30%, 0.08% respectively at similar threshold levels.
Gotsadze, Zoidze & Rukhadze (2009)	Georgia	National survey, *Health Care Utilization and Expenditure survey (2007).*	Costs committed to health care providers for health care services including drugs.	Adapted Xu et al., (2003), methodology. CHE was defined in terms of total non-food expenditure. HH SES was estimated using HH consumption. Threshold applied 40%.	The incidence of CHE was at 11.7%.
Ilunga-Ilunga et al.,2014	Democratic Republic of Congo	District patient survey	Direct payment made for Malaria care and treatment.	Adapted methodology proposed by Xu et al (2003). HH SES was estimated based on consumption. CHE was defined with respect to both total and non-food household consumption. Threshold levels applied: 10% and 40% respectively.	At the 40% threshold level the incidence of CHE was 81.1% and 46.4% at the 10% threshold level.
Kwesiga, Zikusooka & Ataguba (2015)	Uganda	National survey, (2009/10).	Direct payments made to health care providers including traditional medicines	The study adapted Ataguba, (2012), methodology. Consumption was the measure of HH SES.	At the 5% threshold level, the incidence of CHE was at 38% whilst at the 10%, 15% & 25% threshold levels the incidence was about 22%, 15% & 7% respectively.

			excluding insurance reimbursements.	Thresholds applied 5%,10%,15% 25%	The catastrophic payment gap varied from 3.8% at the 5% initial threshold level to 0.8% at the 25% initial threshold level. The incidence and intensity both declined with increasing threshold.
Laokri et al., 2014	Benin	Patient TB survey (2008-2009)	Direct payments made for TB care and services including drugs.	Applied Wagstaff & van Doorslaer (2003), methodology. CHE was defined using the total health expenditure approach. Thresholds applied: 5%, 10%, 15%, 20% and 25%.	At the 10% threshold, the incidence of CHE was 71.8% while the catastrophic and mean positive gap was about 7.8% and 14.8% respectively. The burden was higher among those in the poorest quintile.
Lara & Gomez (2009)	Bogota, Columbia	National survey, *Health Services Use and Expenditure* Study.(2001)	Direct payment made for health services.	Adapted Xu et al., (2003) methodology. CHE was defined as health payment exceeding 20% of total non-food expenditure.	The average incidence of CHE was 4.5%.
Mills et al.,(2012)	Ghana, Tanzania and South Africa	National surveys.	Direct payments made to health providers excluding insurance reimbursement.	CHE was defined in terms on total non-food consumption expenditure. HH SES was estimated using consumption expenditure. Threshold level applied: 40%.	On average, the incidence of CHE in Ghana, Tanzania and South Africa was 2.43%, 1.52%, and 0.09% respectively. For both Ghana and Tanzania the weighted index exceeded the unweighted index, indicating that the burden of CHE was

					disproportionately more among poor HHs than the rich.
Minh et al., (2012)	Vietnam	National survey *(Living Standard Survey*), (2002-2010).	Direct payments made to health care providers for health services excluding insurance re-imbursement and transport costs.	The study adopted Xu et al., (2003) methodology. SES was estimated based on consumption. CHE was defined in terms of both total and non-subsistence HH expenditure. Threshold used 40%.	The proportions of HHs with catastrophic expenditure at the 40% threshold level in 2002, 2004, 2006, 2008 and 2010 were 4.7%, 5.7%, 5.1%, 5.5% and 3.9% respectively. The result indicated that the incidence of CHEs declined significantly over the years. Also, the incidence of CHE was inversely proportional to income and the trend was similar in both measurements approaches (capacity to pay and total expenditure) Lastly, the capacity to pay based-measures had higher indices compared to the total expenditure-based measures.
Nguyen, Rajkotia & Wang, (2011)	Ghana's two districts (Nkoranza & Offinso).	District survey. (2007)	Direct payment made to health care providers excluding preventative care costs.	HH SES was estimated using both income and consumption. CHE was defined in terms of income and consumption expenditure.	*Consumption approach*: for the uninsured groups at the 10% & 20% threshold levels using the non-food consumption expenditure approach, the incidence of CHE was about 2.6% and 2% respectively. While the insured at the same threshold

					levels recorded about 1.5% and 0.9% respectively. *Income approach:* At the 5% and 10% threshold levels, for the uninsured groups the incidence of CHE was 2.1% and 2.8%respectively whereas for the insured members reported about 1.2% and 1.5% respectively. The study found health insurance as protective against CHE.
O'Donnell et al.,(2005)	Bangladesh, Hong Kong, India, Sri Lanka, Thailand and Vietnam.	National surveys, (1996-2002).	Direct costs excluding insurance reimbursements.	Adapted Wagstaff & van Doorslaer (2003), methodology. SES was estimated using consumption expenditure. CHE was expressed in terms of total health expenditure. Threshold applied 10%.	The percentage of HHs exceeding the threshold varied from 3-3.5% in Sri Lanka and Thailand to more than 15% in Bangladesh and Vietnam. It was almost 6% in Hong Kong and about 11% in India.
Onoka et al., (2011)	Nigeria's two states. (Enugu & Anambra).	States survey, (2008).	Direct payments made to health care providers including transport costs.	Modified Wagstaff & van Doorslaer (2003), methodology. CHE was examined based on non-food expenditure and a set of variable and fixed threshold levels.	In the case of non-food expenditure (40% fixed threshold) the incidence of CHE was 14.8%. Using the variable threshold (at initial threshold 5% for the poorest and 29.6 % for the richest) the incidence of CHE was

				Variable thresholds were weighted by a ratio of HH expenditure on food. Measure of HH SES was consumption.	44.7% and 12% respectively, and, the overall incidence was 36.5%. The incidence by the variable threshold was higher than the fixed approach.
Onwujekwe, Hanson & Uzochukwu (2012)	Nigeria	State survey	Health expenditure consisted of direct payment made to health providers	Adapted methodology proposed by Xu et al., (2003). 5% non-food expenditure threshold level was used to compute overall incidence of CHE. HH SES was estimated based on consumption.	Overall, the incidence of CHEs was about 27%, and they tend to decline with increasing income levels.
Saksena et al., (2011)	Rwanda.	National survey, *(Integrated* *Living Conditions Survey)*. (2005-2006)	Direct payment made to health providers for services excluding insurance re-imbursement.	Adopted Xu et al., (2003), methodology. HH SES was estimated using consumption. CHEs expenditure was defined in terms of non-substance expenditure. Thresholds: 10%, 20% and 40%.	(*The study reported overall incidence of CHE and also for un-insured household).* Overall, the incidence of CHE was 16.2%, 8.7% and 2.9% for the 10%, 20% and 40% thresholds respectively Whereas for the uninsured HH, the incidence of CHE was 32%, 17% and 5.8% at the 10%, 20% and 40% threshold levels respectively.

					The burden of health payment was higher among those uninsured. In both groups the incidence of CHE declined with increasing threshold, indicating that the burden of health payment was high among poor HHs.
Sene & Cisse (2015)	Senegal	National survey, *Poverty monitoring survey* (2011)	Direct payment made to health care providers including transport costs. Reimbursed costs were excluded.	The study adapted the supplemental poverty measures (SPM) along with the Wagstaff & van Doorslaer (2003) methodology to estimate catastrophic expenditures. In addition to headcount the study also reported the mean positive gap and the degree of income–related inequality in the distribution of CHE using the concentration index (C_E). CHE was defined with respect to both total and non-food expenditure. HH SES was estimated based on consumption.	The incidence and intensity of catastrophe were higher at lower threshold levels and tended to decline with a rise in threshold levels e.g. at the 5% level (16.2%) and at the 25% level (1.10%). The incidence of catastrophe was generally higher with the non-food expenditure compared to total health expenditure, and a similar trend was noted with regards to the weighted-based measures. The C_E remained concentrated among the poor in all the thresholds level.

				Thresholds applied: 5%, 10%, 15%, 20% and 25%.	
Su, Kouyate & Flessa (2006)	Burkina Faso	District Survey *Health District survey*. (2000-2001).	Direct costs of health care including transport costs for transport, food and lodging net insurance reimbursement.	SES was estimated based on HH expenditure as a proxy for HH income. Catastrophic expenditure was defined in-terms of non-food expenditure. Thresholds applied: 20%,30%,40 and 60%	The incidence of catastrophe was higher among HHs found in the lowest quintile. For example at the 20% threshold level, the poorest HHs reported about 26% catastrophe headcount whilst the better off in the highest income quintile reported 13.5%
Tomini, Packard & Tomini (2012)	Albania	National survey (*Living Standards Measurement Survey)* (2002, 2005 and 2008)	Direct health payments made to health care providers by HHs.	Adapted Wagstaff and van Doorslaer (2003). HH SES was estimated using HH consumption expenditure. Thresholds applied: 5%, 10%, and 20%.	The incidence of CHE declined with increasing thresholds and income throughout the years e.g., in 2002 at the threshold level 5%, 10%, 15% and 25% the incidence of CHE was 36.5%, 22.6%, 14.9% and 8.1% respectively. A similar pattern was maintained by the overshoots and mean positive overshoot estimates. There was a decline in the incidence of CHE over the years (2002, 2005 and 2008) as indicated by the respective estimates 22.6%, 17.6% and 13.3% respectively.

Ukwaja et al., (2013).	Nigeria, Ebonyi State.	TB Patients-District survey. (2007)	Direct costs for TB treatment and care including transport and coping costs.	Applied the Wagstaff & van Doorslaer (2003), methodology. The measure of SES was consumption. CHE was defined in terms of both total and non-food HH expenditure. Thresholds applied: 10% and 40%.	The incidence of catastrophe declined with increasing threshold levels. About 65% HHs were reported to have experienced CHEs at the 10% threshold level while about 44% at the 40% threshold level.
Wagstaff & van Doorslaer (2003)	Vietnam	National survey, (*Living Standards Surveys (VLSS*). (1992-1993) (1997-1998)	Payments associated with treatment including inpatient care but not reimbursed.	Catastrophic health expenditure (CHE) was defined in both total and non-subsistence consumption expenditure. The study further assessed the average catastrophic payment gap (*Gcat*); mean positive gap (*MPGcat*) and rank-weighted indices (head count incidence and intensity). A concentration index (C_E) was also used to assess the degree of income–related inequality in the distribution of CHE.	In both years and consumption expenditure shares, the headcount and gap declined over the years (1993-1998). Also, both rank-weighted indices notably declined with increasing threshold values in both consumption expenditure shares as well. *For example; based on the total expenditure approach in 1993, the weighted headcount at the 5%, 10% and 15% threshold levels were 38.6%, 18.2% and 9.2% respectively.* In *the total expenditure* approach payments were concentrated among the poor only at lower thresholds levels whilst all gap

				Thresholds applied in the total consumption expenditure case: 2.5%, 5%, 10% & 15%. Thresholds applied in the non-subsistence consumption expenditure (capacity to pay) case: 10% 20%, 30% & 40%	measures were concentrated amongst the rich. In the *non-subsistence* approach both catastrophic payments and gaps are concentrated among the poor but less so in 1998 at the threshold levels of 30% and 40%. In general, all rank- weighted welfare measures declined with increasing threshold levels in both approaches. However, the indices by the non-subsistence (capacity to pay) approach were generally higher than those of total expenditure, e.g., in1998 at the threshold level of 10%, the weighted headcount in the total expenditure was 13.8% whilst it stood at 47% in the total non-subsistence approach.
Xu et al., (2007)	N= 89 Countries from different income	Multi-country, National surveys. (1990-2003)	Direct payment made to health care providers excluding insurance reimbursement.	Applied the Xu et al., (2003), methodology. SES was based on consumption. CHE was expressed in terms of non-health expenditure; that is	Average incidence of CHEs was 2.3%, and the range was between 0% (U.K, Czech Republic& Slovakia) to >10% (Brazil & Vietnam). High income countries reported lesser incidence of catastrophe than their low-

	levels and regions.			health payments =/> 40% of HH ATP.	income counterparts with only a few reporting about 0.5% e.g., U.S.A & Portugal.
Xu et al.,(2003)	N=59 countries from different income levels and regions.	Cross-country, National surveys, (1992-2000)	Payments committed to health care providers and not reimbursed by a third party.	Applied the Xu et al., (2003). Measure of HH SES was consumption. CHE was expressed in terms of non-food expenditure; that is health payments =/> 40% of total HHs ability to pay (ATP).	CHEs incidence was low in advanced economies than the others with only a few countries reporting more than 0.5% (Portugal, Greece, USA & Switzerland). Whilst the developing on average recorded high incidence CHEs ranging from >3% to about 11% in Vietnam.
Yardim, Cilingirolu & Yardim (2010)	Turkey	National survey, (*Budget Survey, Consumption Expenditures*), (2006)	Direct payments made to health care providers for services excluding insurance reimbursement.	Applied Xu et al.,(2003), methodology. HH SES was estimated based on consumption. CHE was defined based on total non-food consumption expenditure. A concentration index was used to assess the degree of income related inequality in the distribution of CHE. Threshold applied: 40%	On average about 0.6% of the HHs across expenditure quintiles had CHE. The lowest expenditure quintile reported 0.5% whilst the highest reported 0.6%.
Yardim, Cilingirolu & Yardim (2014)	Turkey	National survey, *Household Budget Surveys*	Direct costs of care net insurance reimbursement.	Adopted Xu et al., (2003) methodology. HH SES was estimated based on consumption.	CHE was 0.75%, 0.59% and 0.48% in 2003, 2006 and 2009, respectively. The levels of CHE declined over the year.

		(2003, 2006 and 2009).		CHE was defined in terms of capacity to pay. Threshold applied:40%.	
Young Lee & Shaw (2014)	South Korea	National surveys	Direct payments for health services including inpatient and outpatient care.	Applied Wagstaff & van Doorslaer (2003) methodology. CHE was defined in terms of total non-food expenditure. Consumption was the measure of HH SES. Thresholds applied: 10%,20%,30% & 40%	The average incidence of CHE at the 40% threshold level was 5.7%. whereas relative to income quintiles from the poorest to richest the incidence of CHE was about 5.7%, 1.67%, 0.72%, 0.33% and 0.27% respectively. At the 10% threshold level the incidence of CHE relative to income quintiles (poorest-richest) reported was 38.48%, 22.33%, 17.02%, 13.77% and 10.19% respectively. In all the thresholds, the incidence of CHE declined with increasing income.

2.3.2 Studies assessing the impoverishing effects of health care payments

Brief summary of the reviewed evidence

Given that the catastrophic measures do not indicate the financial hardship caused to households by out-of-pocket health payments, literature was further reviewed for studies that assessed the impoverishing effects of such payments. The argument here is that not every household experiencing catastrophic health expenditures gets impoverished, however, the burden of health care payments could be worse for poor households who spend a bigger share of their income on food such that in the event of illness they are required to trade-off spending on food for health payments (O'Donnell et al., 2008).

Under this section, a total number of sixteen studies were reviewed both from low and high income countries. Most studies applied either the national or international poverty line[11] to define poverty. However, there were a few that used both poverty lines (Kwesiga, Zikusooka & Ataguba, 2015; Arsenijevic, Pavlova & Groot, 2013; Mills et al., 2012; Akazili, 2010), while Wagstaff & van Doorslaer (2003) applied the food (extreme) poverty line and a broad based poverty line. In addition to the poverty headcount, only a few studies reported the poverty gap measures (normalized, mean positive gap) (Narci, Sahin & Yuldirm, 2015; Akazili, 2010; Wagstaff & van Doorslaer, 2003). Furthermore, it was noted that higher poverty lines yielded higher estimates compared to lower poverty lines (Akazili, 2012; van Doorslaer, 2006). This evidence supports the notion that the impoverishing effect of health expenditure mimics the existing patterns of poverty in a society; countries with high poverty levels are likely to report high levels of impoverishment from out-of-pocket payments (Arsenijevic, Pavlova & Groot, 2013). (See Table 2, below summarising characteristics of the studies reviewed).

[11] Poverty lines are measures of household standard of living. National poverty lines define poverty in relation to minimum acceptable absolute amount of household expenditure per capita computed using country specific measures/income level. Whilst the international poverty lines were developed by the World Bank.

Table 2. Studies assessing impoverishment effects of out-of-pocket health care expenditure.

Study Author (year)	Country	Study design & country	Method/living standard measures	Findings, explanation and conclusion
Akazili (2012)	Ghana	National survey	HH SES was estimated using consumption expenditure. The two absolute poverty lines developed by the World bank $1.25 and $2.50 per capita at 2005 purchasing power parity (PPP) were applied to estimate poverty headcount. In addition to headcount the study also measured normalized and mean poverty gap	*Using the $1.25/day poverty line;* About 1.59% of the population was driven into poverty as a result of health payments. The normalized poverty gap and the normalized mean poverty gap were about 2.29% and 9.59% respectively. *Using the $2.50/day poverty line;* About 1.8% of the population was pushed into poverty as a result of health payments. The normalized poverty gap and the normalized mean gap was about 2% and 2.56% respectively. With higher poverty lines the number of HHs drawn into poverty was higher compared to that for lower poverty lines.
Akinkugbe, Chiliba & Tlotlego (2012)	Botswana and Lesotho	National survey ,*Household and Expenditure Survey* (2002/2003).	Consumption was the measure of HH SES. Applied each country's national poverty line (2002/2003)	Botswana recorded high levels of impoverishment as a result of CHE health payments compared to Lesotho, 80% and 21% respectively.

		Botswana *Household Budget Survey* (2002/2003). Lesotho		
Arsenijevic, Pavlova & Groot, (2012).	Serbia	National survey, *Living Standard Measurement Study* (LSMS). (2007)	Used both income and consumption as a measure of HH socioeconomic status (SES). Use absolute poverty line, 8883 CSD per capita per month and a relative poverty line 11283 CSD per capita per month. (1 CSD = 0.0125 Euro)	On average, for the *income-based measures* when using the absolute poverty line, about 2.4% of the population was pushed into poverty due to health payments while about 1% for the *relative poverty line*. For the *consumption-based measures* using the absolute and relative poverty lines about 1.1% and 2.1% of the population were pushed into poverty respectively.
Bredenkamp, Mendola & Gragnolati (2010)	Albania; Bosnia and Herzegovin ;Montenegro; Serbia and Kosovo.	Cross-country national survey, *Living Standards and Measurement Surveys or any equivalent*, 2000–2005.	Indicator of HH SES was based on total non-health income expenditure. National Poverty Lines close to the time of the surveys were used for each country calculated in local currency units by the World Bank per capita/month, and these were namely: 5145.33 new Lek in Albania; 90.34 Euro in Montenegro; 4111.31 dinars in	Health care payments increased the poverty head count among the 5 countries by the following levels: Albania 2.8%, Kosovo 6.26%, Serbia 1.24%, Bosnia and Herzegovina 1.73% and Montenegro 0.4%. Poverty gap increased by 46.8%, 8.8%, 0.03% 15.1% and 3.4 % for Albania, Bosnia and Herzegovina, Montenegro, Serbia and Kosovo respectively.

			Serbia; 106.689 DM in Kosovo and 2223.146 KM per year in Bosnia and Herzegovina	The poverty measures were relatively low in Montenegro than in all the other countries.
Chuma & Maina (2012)	Kenya	Household survey, *Health expenditure and utilization survey* (2007)	Applied 2007 National poverty line'	Poverty head count from health payments was estimated at 2.7% while the normalized mean positive gap was 9.5%.
Flores et al., (2008)	India	National Sample Survey (1995–1996)	HH SES was estimated using HH expenditure. In addition to measuring poverty head count, the study also measured 'transient poverty i.e. OOP *payments financed from income* and 'hidden poverty i.e. OOP *payments financed by coping strategies*. Health payments were adjusted for the effects of coping. Used national poverty line to compute poverty headcount.	Standard poverty headcount was 0.51% for urban and 0.65% for rural. Transient and hidden poverty headcount were about 0.6% and 0.45% respectively. The results indicated that coping has a significant impact on the impoverishment effects of health payments.
Kwesiga, Zikusooka & Ataguba (2015)	Uganda	National HH survey, 2009/10.	Consumption was the measure of HH SES. Poverty was assessed using Ugandan poverty line (Shs=29 306.32) and the international poverty line - $1.25 in 2005 PPP.	The poverty head count from health payments was 4.2% while the normalized gap remained at 1.4%. A similar trend was observed in using the international poverty line.

				According to the Pen's parade, a great number of HHs had to reduce their consumption expenditure as a result of health payments.
Mills et al.,2012	Ghana, Tanzania and South Africa	National surveys	HH SES was estimated using consumption expenditure. They used international absolute poverty line of $1.25 per capita per day at the 2005 PPP.	The poverty head count from health payments was 1.59% in Ghana, 0.045% in South Africa and 0.37% in Tanzania. The impoverishment effect of CHE was higher in Tanzania whilst South Africa recorded the least.
Minh et al., (2012)	Vietnam	National Living Standard Survey, 2002-2010.	SES was estimated based on consumption. Average HH subsistence spending was used as a poverty line.	The rates of HH pushed below the poverty line because of CHE in 2002,2004,2006,2008, 2010 were 3.4%, 4.1%, and 3.1%, 3.5%, and 2.5% respectively.
Narci, Sahin & Yildirim (2014)	Turkey	National survey (2004-2010)	HH SES was estimated using consumption. A total of six poverty lines were used in the study in all the years, three national poverty lines (food, complete[12] and relative) and international ($1, $2.15 and $4.30) per capita/day adjusted for 2005 PPP.	Overall poverty head count from health payments were below 1% across the years, while poverty gaps reached a maximum of 0.098%. However, it was noticeable that the poverty head count varied according to the poverty line used, except for complete and relative poverty that remained less than 1% throughout the years. For example, in 2010 the poverty headcounts at the various poverty lines

[12] Complete poverty line refers to the food and non-food poverty line. It is defined as the minimum amount of expenditures for food and non-food goods that per person should make in order to be able to meet minimum living standards.

				(national, complete, relative, $1, $2.15, and $4.30) were estimated at 0.25%, 1%, 5%, 0.01%, 0.09% and 0.58% respectively.
Sene & Cisse (2013)	Senegal	National survey	HH SES was estimated based on consumption. Poverty line used was based on the costs for meeting basic needs method.	About 1.44% HHs fell below the poverty line by paying for health care.
Tomini, Packard & Tomini (2012)	Albania	National survey (Living Standards Measurement Survey) (2002, 2005 and 2008)	Consumption expenditure was used to estimate HH SES. Food poverty line (3047ALL per capita expenditure for 2002, 2005 and 2008).	As a result of health payment poverty increased by 6.49% in 2002, 4.34% in 2005 and 3.61% in 2008. A similar trend occurred with the poverty gap. The normalized poverty gap and mean positive poverty gap slightly decreased between 2002 and 2005 but rose to a high level in 2008. This indicates that inequality due to CHE did not change much over the years.
Wagstaff & van Doorslaer (2003)	Vietnam	National survey (*Living Standards Surveys (VLSS*). 1992-1993 1997-1998	Consumption was used to estimate SES. Food poverty line and broader-based poverty line based on food and non-food requirements for 1993 and 1998 was used.	*In the food poverty line*; the poverty head count was 4.4% in 1993 and 3.4% in 1998. The normalized gap for both years 1993 and 1998 was 1.4% and 0.8% respectively. *Overall poverty line*; poverty headcount for 1993 and 1998 was 0.4% and 0.5% respectively. While the normalized gap in both years (1993 & 1998) was about 0.4% and 0.2% respectively.

Yardim, Cilingirolu & Yardim (2010)	Turkey	National HH survey ,(*Budget Survey, Consumption Expenditures*), (2006)	SES was estimated based on consumption. Subsistence expenditure per capita was used as a poverty line (dashes) = 152.14 USD in 2006 PPP.	About 0.4% of the HH fell below the poverty line after health payments. The impoverished HHs were notably in the first and second expenditure quintiles, 1.7% and 0.1% respectively.
Yardim, Cilingirolu & Yardim (2014)	Turkey	National survey, Household Budget Surveys 2003, 2006 and 2009.	HH SES was estimated based on consumption. Subsistence expenditure per capita poverty line was used to assess poverty namely; 93.72 TL, 140.11 TL and 183.74 TL for 2003, 2006 and 2009 PPP respectively.	Impoverishment due to health payments was 0.26%, 0.75% and 0.22% for the respective years (2003, 2006 & 2009). A slight inflation was in 2006, followed by a decreasing trend. The decreasing figures were viewed as positive impacts of increased prepayment coverage in the country within those years.
Young Lee & Shaw (2014)	South Korea	Two National HH survey (*Health and Nutrition Examination Survey along with HH Income and expenditure Survey*. (2007-2009)	Consumption was the measure of HH SES. A national poverty line was used to determine poverty (2007-2009).	The average impoverishment rate as result of health payments was 1.51%.

2.3.3 Studies assessing the factors associated with households' vulnerability to financial risk

Brief summary of the reviewed evidence

Based on the review, most studies used either linear or multivariate regression analysis. A few exceptions include Knaul et al., (2011) who compared sub-groups within each country by the factors associated with incurring catastrophic expenditure; Akinkugbe, Chama-Chiliba & Tlotlego, (2012) using bivariate and chi-square analysis and lastly Habibov, (2009) who applied a tobit regression.

Table 3. Studies assessing factors influencing household vulnerability to catastrophic health care expenditure.

Study Author (year)	Country	Study design, year	Method/living standard measures	Analytical methods	Variables	Findings ,explanation and conclusions
Somkotra & Lagrada (2009)	Thailand	National survey (2012)	consumption	logistic regression	**Dependent variable:** incurring CHEs **Independent variable**: insurance status, sex of HH-head.	Factors found associated with HHs incurring financial risk were namely; hospitalisation, belonging to the upper quintile of income distribution range and HHs with elderly members.
Abu-Zaineh.,et al.,(2013)	Tunisia	National survey. *Health Care Utilization and Morbidity Survey (HCUMS*). (2006)	Total and non-subsistence household expenditure	Multivariate logistic regression	**Dependent variable:** Financial protection and Incurring CHEs **Independent variable**: HHs with members living with a disability; socio-economic status; insurance status; household-head sex, and educational status; hospitalisation; and place of residence.	Factors associated with HHs likelihood of incurring CHEs included: Being female; female HH-head; being rural and having insurance.

Akinkugbe, Chiliba & Tlotlego (2012)	Botswana Lesotho	National survey,	Consumption	Logistic regression	**Dependent variable:** incurring CHEs **Independent variable** *(both countries):* Income level; HH head (gender, educational status, employment status and marital status); location; HH size.	Determinants found associated with HH incurring financial risk: *In Botswana:* Being rural; HH head with less education and low income status. *In Lesotho:* Ages>65 years and large HH size
Barros et al., (2011)	Brazil	National survey, *Household Budget Survey* (2002-2003)	Total and non-food household expenditure	Poisson regression	**Dependent variable:** Incurring CHEs **Independent variable**: Sex of HH-head; being un-insured; HH member age >60 years and more than two children; race and income level.	Being poor, HHs living with an elderly members and being insured. HH-head characteristics and children were found having no correlation with CHE.
Brinda, Andres & Enemark (2014)	Tanzania	National panel Survey. (2008-2009)	Non-subsistence household expenditure	Linear regression model	**Dependent variable**: Incurring CHEs. **Independent variable:** Age; gender; HH-head (marital, educational and occupational	Factors associated with CHE: Large HH size; unemployed HH head; chronic illnesses.

					status); asset index; disability and morbidity.	
Ekman (2007)	Zambia	National survey. *Living Conditions Monitoring Survey*. (1990)	non-subsistence household expenditure	Multivariate regression	**Dependent variable**: Incurring CHEs **Independent variable**: Head of HH (age, sex and education level); income ; location; distance to health provider; presence of illness	Factors associated with the risk of CHEs were namely; being not insured; age 60+ years; long distance to care point. In summary, the findings illustrate that the level of financial risk protection by insurance is largely determined by the country's context.
Gotsadze, Zoidze & Rukhadze (2009)	Georgia	National survey (2007).	consumption	logistic regression (logit) model	**Dependent variable**: incurring CHEs **Independent variable**: type of illness, SES, and level of care.	Factors found associated with CHE were namely: hospitalisation, low income level and living with a member with a chronic illness.
Ilunga-Ilunga et al.,2014	Democratic Republic of Congo	District patient survey	consumption	Bivariate and Multivariate logistic analysis	**Dependent variable**: incurring CHEs **Independent variable**: HH living standards; sex of HH head; neurological complication; type of recourse.	Factors found associated with CHE were low HH standard of living; female HH head; neurological complication and indirect recourse (pre-hospital treatment).
Knaul et al.,2011	Multi-country	National surveys.	Non-subsistence household	Compared sub-groups within each	**Dependent variable**: Sub-groups incurring CHEs	Factors associated with CHEs:

	N=12 Latin and Caribbean countries	(2000-2007).	consumption expenditure	country by the factors associated with incurring catastrophic expenditure	**Independent variable**: HH income; HH size; location; health insurance; HH composition	Being rural; low income; small family size; lack of insurance;
Lara & Gomez (2009)	Bogota, Columbia	National survey, *Health Services Use & Expenditure survey*. (2001)	Non-subsistence household consumption expenditure	Probit binary response model	**Dependent variable**: Incurring CHEs **Independent variable**: HH income; HH size; disability; HH head (sex; age; employment status); HH insurance status; type of health care consumed.	Factors associated with CHEs HH size of 1or 2 persons; being uninsured; lacking formal employment; inpatient care and low income.
Li et al., (2012)	China	National survey. *Fourth National Health Service Survey*. (2008)	Household non-subsistence expenditure	Logistic regression	**Dependent variable:** Incurring CHEs **Independent variable**: Education level; employment status of HH head; insurance status of the HH head; HH member living with a chronic disease; income level and location.	Factors associated with HHs likelihood of incurring CHEs were no education; chronic conditions; hospitalisation; age 60+ years; tuberculosis; being rural and female and being poor.

Minh et al., (2012)	Vietnam	National survey, *Living Standard Survey*, (2002-2010).	Consumption	logistic regression analysis	**Dependent variable:** incurring CHEs **Independent variable**: insurance status, HH-head gender, HH size, location, income level, HH with children.	Small HH size; HH member of age <6 years and 60+ years; uninsured, being poor and being rural.
Nguyen, Rajkotia & Wang (2011)	Ghana (Nkoranza & Offinso).	District survey. (2007)	Income and consumption.	Probit model	**Dependent variable**: Incurring CHEs **Independent variable**: HH head (education, occupation, and gender); chronic health condition; HH size; insurance status income level.	Factors associated with CHE were namely; Being female HH head with no or less education and low income. Being insured was found to be protective against CHEs.
O'Donnell et al.,2005	Bangladesh Hong Kong, India, Sri Lanka, Thailand and Vietnam.	National and provincial surveys. (1998-2000).	consumption	Probit analysis was used to examine factors associated with HH vulnerability to financial risk.	**Dependent variable:** incurring CHEs **Independent variable:** Health insurance; location; household size and composition; HH-head (age, sex, education and employment) status.	Determinants of CHEs: Being rural; poor living conditions e.g., poor sanitation; lack of insurance and lack of insurance.

Saksena, Smith & Tediosi (2014)	Multi-country, N=51 countries	National study, (*World Health Survey*- (2000-2003)	Non-subsistence household expenditure.	multi-level modelling	**Dependent variable**: Household experiencing financial hardship. **Independent variable**: *Household level*: Age; household with a member living with disability; education level of HH head sex and educational status; residence (urban/rural) and insurance status. *National level*: total health expenditure per capita; percentage of out-of-pocket payments as a share of total health expenditure; government expenditure on health as a share of total government expenditure; prepayment financing mechanisms (a tax-based; mixed system or social health Insurance-based system).	Variables associated with financial hardship: *Household level* Being an elderly age 60+ years or children <5 years; households with a member living with a disability; being rural; poor households; low level of education by the HH-head (less than secondary) and absence of health insurance. *National level*: The share of out-of-pocket payments in total health expenditure was found as a key-robust indicator (proxy) for financial hardship. Level of inequality in household expenditure (measured using Gini coefficient of HH expenditure) also had a significant relationship with catastrophe.
Sene & Cisse (2015)	Senegal	National survey.	Consumption	Tobit regression	**Dependent variable:** incurring CHEs	Factors found associated with CHE were namely: elderly 50+ years; children below

		Poverty monitoring survey. (2011).		(*that involves censoring through a conditional mixed-process estimator procedure in order to account for those who utilised without paying for the services).*	**Independent variable**: Utilisation of health care; location; HH head (sex, age and level of education); Illness severity; living with an elderly; housing size; toilet facilities; mosquito nets; level of care consumed.	five years of age; treatment adverse events; female HH-head, being rural and lack of health insurance.
Su, Kouyate & Flessa (2006)	Burkina Faso	District Survey. (2000-2001)	Consumption	Multivariate logistic analysis	**Dependent variable:** incurring CHE **Independent variable: illness and treatment, HH:** HH SES; HH-head's sex and educational status; HH size; location; age of HH members and type of illness and treatment episode.	Health care utilisation particularly the use of modern/advanced care; chronic disease; large HH size; female HH-head; poor household; lack of insurance.

Xu et al.,(2003)	Multi-country, N=59 countries	National surveys, (1992-2000).	Non-food consumption expenditure.	Regression analysis	**Dependent variable**: incurring CHE. **Independent variable**: Out-of-pocket payment share in total health expenditure, total health expenditure share of GDP (used as a proxy for health service use) and proportion of households below poverty line.	Three conditions that were identified as preconditions for catastrophic expenditure: Availability of services requiring payment, low capacity to pay, lack of prepayment or health insurance.
Xu et al.,(2007)	Multi-country, N=89 countries	National survey. (1990-2003)	Non-subsistence household expenditure	Regression analysis	**Dependent variable**: incurring CHE **Independent variable**: Households with a member aged 60+ years or <5 years; GDP per capita; total health expenditure as a share of GDP and prepayment share in total spending.	The following factors were found associated with CHEs: Household with a member aged >/= 60 years. No significant association found with age <5 years. Worth noting is that the health financing indicator was found to be associated with HHs CHE in developing countries but less so among developed countries. Also, social health insurance was found to offer better financial health protection than a taxed based system.
Yardim, Cilingiroglu	Turkey	National survey ,(*Budget Survey,*	Non-subsistence household	(bivariate and	**Dependent variable**: Incurring CHEs **Independent variable**:	Factors that predicted CHEs *Bivariate analysis*: low education; no insurance; unemployment; HHs with a

& Yardim (2010)		*Consumption Expenditures*), (2006)	consumption expenditure	Simultaneous multivariate techniques)	HH income; HH size; disability; HH head (sex; age; employment status); HH insurance status; type and level of health care services consumed. NB: those variables that were found significant in the bivariate analysis were then assessed simultaneously by logistic regression.	member living with a disability; age 65+ years and being a rural resident. *Multivariate analysis*: No insurance; disability; elderly 65+ years; being a rural resident; a unit rise in health expenditure per capita.

2.4 Discussion of the evidence reviewed

The level of catastrophic health expenditure and its impoverishment effects have been widely applied in assessing and drawing attention to the financial protection status in countries (Wagstaff & van Doorslaer, 2003; Xu et al., 2003; Xu et al.,2007).

In the assessment of catastrophic health expenditure, studies defined catastrophe either both in terms of total or non-food household expenditure (capacity to pay[13]). However, the two measures often yielded different results. The indices by the non-food approach tend to be higher than the total expenditure based measures (Séne & Cissé, 2015; Ataguba, 2012; Chuma & Maina, 2012; Bredenkamp, Mendola & Gragnolati, 2011; Wagstaff & van Doorslaer, 2003). Similarly, studies that employed income as an indicator of household welfare also reported higher estimates on average compared to consumption measures (Arsenijevic, Pavlova & Groot, 2013; Nguyen, Rajkotia & Wang, 2011). The latter difference may not be completely surprising as Deaton, (2002) asserted that income is likely to be underreported particularly in countries in which employment is largely informal, thus most individuals may appear to have far lesser resources (low income) compared to consumption levels hence the higher estimates of catastrophe with income. In another sense, this discrepancy seems to support the argument that the distribution of catastrophic health expenditure to a certain extent depends on the households' welfare indicator applied as well as the approach employed in defining catastrophic payments (total (non-food) expenditure/income).

Furthermore, this could partly explain the variation in findings by studies (Wagstaff et al., 2011; O'Donnell et al., 2008; Wagstaff & van Doorslaer, 2003; Xu et al., 2003). It is however, important to note that while the estimates by these two measures (total and non-food expenditure) appear to yield different results, they were observed as consistent in meaning. For instance, applying the two approaches (total and non-food expenditure) in a particular population, it is less likely that one approach could report absence of catastrophe and have the other reporting otherwise (Arsenijevic, Pavlova & Groot, 2013). This could be due to the underlying assumptions which remains similar for both

[13] Total consumption expenditure net subsistence food expenditure.

measures which is; health payment displacing household spending on essential non-medical goods and also being non-discretionary (Wagstaff & van Doorslaer, 2003).

On another hand, there have been studies that have sought to incorporate the principle of vertical equity in the assessment of catastrophic health expenditure by modifying the conventional methodology proposed by Wagstaff & van Doorslaer, (2003) and applied a variable threshold (Ataguba, 2012; Onoka et al., 2011). The method by Ataguba, (2012) allowed catastrophe to be a function of where one sits in the income distribution range and its does not require distributional sensitive measures as that by Onoka, (2011). However, evidence by both studies was consistent in suggesting that the uniform threshold approach may under report the incidence of catastrophic health expenditures compared to the varying threshold (Onoka, 2011; Ataguba.2012). The method proposed by Ataguba (2012) has been further applied elsewhere and the findings further support the argument by Onoka, (2011) and Ataguba, (2012) (Kwesiga, 2012).

With respect to levels of catastrophe, evidence showed that households do spend a greater portion of their income on health care and that includes both in advanced and developing economies (Xu et al., 2007; Xu et al., 2003). However, the extent and severity of catastrophe varied by countries' income levels and further by population groups within the countries (Séne & Cissé, 2015; Arsenijevic, Pavlova & Groot, 2013; Chuma & Maina, 2012; Mills et al., 2012; Bredenkamp, Mendola & Gragnolati, 2011; Akazili, 2010; Su, Kouyaté & Flessa, 2006; O'Donnell et al., 2005; Wagstaff & van Doorslaer, 2003; Xu et al., 2003). It was further evident that catastrophic health expenditure is disproportionally more among households in the lower expenditure quintile, particularly in developing countries compared to the developed (Xu et al., 2003; Xu et., 2007; van Doorslaer, 2007). This implied that the poor suffer more than the rich (Chuma & Maina, 2012; Ataguba, 2012; Mills et al., 2012; Yardim, Cilingiroglu & Yardim, 2010; Xu et al., 2007; Su, Kouyaté & Flessa, 2006). For example, a cross-country analysis of 89 countries revealed that about 3% of households in low-income countries incur catastrophe while there were about 1.8% in the middle income and only 0.6% in advanced economies (Xu et al ., 2007). Evidence appears to suggest a number of reasons for the latter, but a plausible explanation was that by Xu et al (2003), stating that advanced economies have well-established social institutions such as social insurances compared to their counterparts with little or non-existent insurance. This evidence was further supported by O' Donnell et al., (2005).

In the case of impoverishment, evidence showed that out-of-pocket health care payments do not only compromise households' standard of living by pushing households

below the poverty line (extent) but they can also deepen poverty levels amongst households that were previously poor before health spending (intensity) (Van Minh et al., 2013; Kwesiga, 2012; Mills et al., 2012). However, the burden was particularly heavy among poor households (Mills et al., 2012; Knaul et al., 2011; van Doorslaer et al., 2007). For example, Mills et al., (2012) found that in South Africa, the rise in poverty as a result of health payments was mainly as a result of previously non-poor households brought into poverty while in Ghana and Tanzania it was mainly the already poor households that deepened into poverty.

Similarly, Bredenkamp, Mendola & Gragnolati, (2010), found that in Albania the impoverishing effects were in extremes in both terms (intensity and extent) followed by Kosovo, Serbia, Bosnia and less so in Montenegro. It was further observed that studies conducted in Africa had the impoverishing effects more in terms of deepening of poverty levels of the already poor (Akazili, 2010; Chuma & Maina, 2012; Kwesiga, Zikusooka & Ataguba, 2015). These findings seem to support the idea that the impoverishment effects of out-of-pocket health care payment tend to mirror the poverty situation in a country and emphasizes the poverty effects among the poor groups (Arsenijevic, Pavlova & Groot, 2012). On another hand, the evidence clearly showed that the extent and intensity of catastrophe and impoverishment vary across households suggesting that some households have a greater propensity to suffer financial risk as a result of out-of-pocket payments than others (Xu et al., 2007).

With respect to factors associated with financial risk, studies found that households' structures, in terms of both household-head characteristics and demographic composition were associated with households facing financial risk. Households of low-socio-economic status, rural, and household head with no or poor (educational or employment) status indicated a greater propensity for financial risk (Ukwaja et al., 2013; Saksena et al., 2011; Ruhweza et al., 2009; Castillo-Riquelme, McIntyre & Barnes, 2008). These findings were consistent with the Grossman model of demand for health care which posits that the educated are efficient producers of health and therefore less vulnerable to financial risk compared to the less educated. Endorsing this evidence further, is the argument that living in a rural area is associated with less education and so is poverty as well as high disease burden (WHO, 2010; O' Donnel et al.,2005). Whilst evidence from a majority of the empirical work supported the latter argument, there is contrasting evidence by Samkotra & Lagrada (2009) suggesting that in advanced economies the risk of households facing financial hardships tend to be more among the rich than among the poor. This evidence also supports the argument that catastrophic

health expenditure is associated with the use of private health care (Abu-Zaineh et al., 2013; Su, Kouyaté & Flessa, 2006).

Household size was another factor found to predict the likelihood of households suffering financial risks; however the evidence was inconsistent with regard to this finding. Some studies reported household size greater than five as associated with households facing financial risk (Kronenberg & Barros, 2014; Yardim, Cilingiroglu & Yardim, 2010; Knaul et al., 2011). However, Lara & Gomez (2009) found larger household size as protective against financial risk. A plausible explanation for the divergent outcome could be that relationships between household size and financial risk is to a greater extent determined by how each household member impacts on household resources as a whole (Maredza, 2009). For example, a household with largely economically active members has more disposable resources and thus faces lesser risk of incurring financial hardship than a household having economically inactive members regardless of size. This line of thought is further supported by Minh et al., (2012).

Furthermore, the elderly aged 60+ years and children <5years were found to be associated with household vulnerability to financial risks (Saksena et al., 2011; Ruhweza et al., 2009). However, other studies found that this group has a protective effect particularly children (Yardim, Cilingiroglu & Yardim, 2010). Xu et al., (2007) however found no association. There have been a number of theories put forth to explain this observation. Habibov (2009), argues that these groups are economically inactive yet consume more services. Whereas those in support of the protective effect assert that children and elderly have access to free health care services and social grants in some countries (Yardim, Cilingiroglu & Yardim, 2010). However, the latter argument is likely to be less applicable in many developing countries where services are largely paid for regardless of the age group (WHO, 2010).

Another large body of evidence assessed financial risk in relation to the availability of health insurances. Most of the empirical work appears to support the notion that prepayment financing mechanisms do offer households protection against financial risks, however the level appears to depend on how these mechanisms are organised within countries (Limwattananon et al., 2015; McIntyre & Meheus, 2013; Saksena et al., 2011; Nguyen, Rajkotia & Wang, 2011). For example, mandatory prepayment mechanisms offer greater protection against financial risk compared to private voluntary insurance (McIntyre, 2007). On the contrary, evidence by Ekman (2007) in Zambia illustrated that being insured was associated with increased likelihood of incurring catastrophic health

costs. This finding was similar to that found elsewhere (Abu-Zaineh et al., 2013; Barros, Bastos & Damaso, 2011; Knaul et al., 2011). However, it was noted that these studies only considered private insurances; meaning they did not look at other form of insurances such as mandatory insurance. Thus, these findings may not be generalised. Generally, however, the evidence could be seen as shedding light on the matter (insurance) and perhaps emphasising that the type of insurance matters in financial protection.

2.5 Conclusions

Catastrophic health expenditure and its impoverishing effects exist across countries but the consequences are more severe among low income countries compared to advanced economies. The distribution differs further with households' income level within countries indicating that some households have a greater propensity to suffer financial risk than others. The poor tend to bear a greater burden of direct health care payment than the rich as they contribute more in terms of budget share. While the poor seems to be the most at risk, it is clear that even the better-offs could still be drawn into poverty as a result of catastrophic health care payments. Also, even though a causal relationship cannot be drawn from the evidence because of the observational nature of the studies reviewed, it is evident that catastrophic health expenditure is associated with households' financial hardship especially among poorer households within countries.

Finally, there are a number of important lessons and gaps that emerged from the review. The assessment of financial health protection in developing countries like Swaziland is limited. The few previous studies, particularly in Africa, mostly examined catastrophe and the predisposing factors and left out impoverishment. This does not give a complete picture of the financial hardship caused to households by direct out-of-pocket payments. In addition, only a limited number of studies assessing catastrophe conducted in Africa used nationally representative surveys. This is a challenge as countries' estimates cannot be drawn from such evidence, and without which it would be difficult for countries to understand the performance of their health systems in protecting individuals and households against unduly financial hurt as a result of out-of-pocket health care payments. Lastly, the application of the variable threshold in the assessment of catastrophe was found limited with only two studies conducted in Nigeria and Uganda (Ataguba, 2012; Kwesiga, Zikusooka & Ataguba, 2015).

2.6 References

Abu-Zaineh, M., Romdhane, H.B., Ventelou, B., Moatti, J. & Chokri, A. 2013. Appraising financial protection in health: the case of Tunisia. *International Journal of Health Care Finance and Economics.* 13(1):73-93. DOI:10.1007/s10754-013-9123-8.

Akazili, J. 2010. Equity in health care financing in Ghana. PhD. Thesis. University of Cape Town.

Arsenijevic, J., Pavlova, M. & Groot, W. 2013. Measuring the catastrophic and impoverishing effect of household health care spending in Serbia. *Social Science & Medicine.* 78:17-25. DOI:10.1016/j.socscimed.2012.11.014.

Ataguba, J.E. 2012. Reassessing catastrophic health-care payments with a Nigerian case study. *Health Economics, Policy and Law.* 7(03):309-326. DOI:10.1017/S1744133110000356.

Barros, A.J.D., Bastos, J.L. & Damaso, A.H. 2011. Catastrophic spending on health care in Brazil: private health insurance does not seem to be the solution. *Cadernos De Saude Publica.* 27:S254-S262. DOI:doi.org/10.1590/S0102-311X2011001400012.

Bredenkamp, C., Mendola, M. & Gragnolati, M. 2011. Catastrophic and impoverishing effects of health expenditure: new evidence from the Western Balkans. *Health Policy and Planning.* 26(4):349-356. DOI:10.1093/heapol/czq070.

Castillo-Riquelme, M., McIntyre, D. & Barnes, K. 2008. Household burden of malaria in South Africa and Mozambique: is there a catastrophic impact? *Tropical Medicine & International Health.* 13(1):108-122. DOI:10.1111/j.1365-3156.2007.01979.x.

Chuma, J. & Maina, T. 2012. Catastrophic health care spending and impoverishment in Kenya. *BMC Health Services Research.* 12(3):1-9. DOI:10.1186/1472-6963-12-413.

Crystal, S., Johnson, R., Harman, J., Sambamoorthi, U. & Kumar, R. 2000. Out-of-pocket health care costs among older Americans. *Journals of Gerontology Series*

B-Psychological Sciences and Social Sciences. 55(1):S51-S62. DOI:doi: 10.1093/geronb/55.1.S51.

Dercon, S. 2005. Risk, poverty and vulnerability in Africa. *Journal of African Economies.* 14(4):483-488.

Flores, G., Krishnakumar, J., O'Donnell, O. & Van Doorslaer, E. 2008. Coping with Health-Care Costs: Implications for the Measurement of Catastrophic Expenditures and Poverty. *Health Economics.* 17(12):1393-1412. DOI:10.1002/hec.1338.

Gertler, P. & Gruber, J. 1997. *Insuring consumption against illness.* (6035). Cambridge: National Bureau of Economic Research.

Grossman, M. 2000. The human capital model. *Handbook of Health Economics.* 1:347-408.

Habibov, N. 2009. What determines healthcare utilization and related out-of-pocket expenditures in Tajikistan? Lessons from a national survey. *International Journal of Public Health.* 54(4):260-266. DOI:10.1007/s00038-009-8044-2.

Hort, K., Goss, J., Hopkins, S. & Annear, P. 2010. *Conceptual frameworks, health financing data and assessing performance: A stock-take of tools for health financing analysis in the Asia-Pacific region.* (5). Australia: Nossal Institute for Global Health at the University of Melbourne.

Ilunga-Iunga, F., Leveque, A., Laokri, S. & Dramaix, M. 2015. Incidence of catastrophic health expenditures for households: An example of medical attention for the treatment of severe childhood malaria in Kinshasa reference hospitals, Democratic Republic of Congo. *Journal of Infection and Public Health.* 8(2):136-144. DOI:10.1016/j.jiph.2014.08.008.

Jones, A. 2006. *Applied Econometrics for Health Economics.* 2nd ed. United Kingdom: Department of Economics and Related Studies, University of York.

Knaul, F.,Marie, Wong, R., Arreola-Ornelas, H., Mendez, O. & Network Hlth Financing Social 2011. Household catastrophic health expenditures: A comparative analysis of twelve Latin American and Caribbean Countries. *Salud Publica De Mexico.* 53:S85-S95.

Kwesiga, B. 2012. Financial protection in Uganda's health system catastrophic and impoverishment effects of out-of-pocket health care payments. *Masters Thesis, University of Cape Town.*

Kwesiga, B., Zikusooka, C.M. & Ataguba, J.E. 2015. Assessing catastrophic and impoverishing effects of health care payments in Uganda. *BMC Health Services Research.* 15(1):30.

Leive, A. & Xu, K. 2008. Coping with out-of-pocket health payments: empirical evidence from 15 African countries. *Bulletin of the World Health Organization.* 86(11):849-856C.

Limwattananon, S., Neelsen, S., O'Donnell, O., Prakongsai, P., Tangcharoensathien, V., van Doorslaer, E. & Vongmongkol, V. 2015. Universal coverage with supply-side reform: The impact on medical expenditure risk and utilization in Thailand. *Journal of Public Economics.* 121:79-94. DOI:10.1016/j.jpubeco.2014.11.012.

Mankiw, N.G. 2011. *Principles of Microeconomics.* 6th ed. United State of America: Cengage Learning.

Maredza, M. 2009. Economic consequences for households of illness and of paying for health care in Zimbabwe: A case study . Masters in Public Health (Health Economics). University of Cape Town.

McIntyre, D. 2007. *Learning from experience: Health care financing in low-and middle-income countries.* Geneva, Switzerland: Global forum for health research Geneva.

McIntyre, D. & Meheus, F. 2013. Achieving sustainable universal health coverage in low- and middle-income countries. *Health Economics, Policy, and Law.* 8(4):543-548. DOI:10.1017/S1744133113000303 [doi].

McIntyre, D., Thiede, M., Dahlgren, G. & Whitehead, M. 2006. What are the economic consequences for households of illness and of paying for health care in low- and middle-income country contexts? *Social Science & Medicine.* 62(4):858-865. DOI:http://dx.doi.org.ezproxy.uct.ac.za/10.1016/j.socscimed.2005.07.001.

Mills, A., Ataguba, J.E., Akazili, J., Borghi, J., Garshong, B., Makawia, S., Mtei, G., Harris, B. et al. 2012. Equity in financing and use of health care in Ghana, South

Africa, and Tanzania: implications for paths to universal coverage. *The Lancet.* 380(9837):126-133. DOI:http://dx.doi.org/10.1016/S0140-6736(12)60357-2.

Narci, H.O., Sahin, I. & Yuldirm, H.H. 2015. Financial catastrophe and poverty impacts of out-of-pocket health payments in Turkey. *European Journal of Health Economics.* 16(3):255-270. DOI:10.1007/s10198-014-0570-z.

Nguyen, H.T.H., Rajkotia, Y. & Wang, H. 2011. The financial protection effect of Ghana National Health Insurance Scheme: evidence from a study in two rural districts. *International Journal for Equity in Health.* 10:4. DOI:10.1186/1475-9276-10-4.

O'Donnell, O., van Doorslaer, E., Rannan-Eliya, R.P., Somanathan, A., Garg, C.C., Hanvoravongchai, P., Huq, M.N., Karan, A. et al. 2005. Explaining the incidence of catastrophic expenditures on health care: Comparative Evidence from Asia. *EQUITAP Project.* Working paper.

O'Donnell, O., Wagstaff, A., van Doorslaer, E. & Lindelow, M. 2008. *Analyzing health equity using household survey data: a guide to techniques and their implementation.* Washington DC: World Bank Publications.

Onoka, C.A., Onwujekwe, O.E., Hanson, K. & Uzochukwu, B.S. 2011. Examining catastrophic health expenditures at variable thresholds using household consumption expenditure diaries. *Tropical Medicine & International Health.* 16(10):1334-1341. DOI:10.1111/j.1365-3156.2011.02836.x.

Ruhweza, M., Baine, S., Onama, V., Basaza, V. & Pariyo, G. 2009. Financial risks associated with healthcare consumption in Jinja, Uganda. *African Health Sciences.* 9(2).

Saksena, P., Antunes, A.F., Xu, K., Musango, L. & Carrin, G. 2011. Mutual health insurance in Rwanda: Evidence on access to care and financial risk protection. *Health Policy.* 99(3):203-209. DOI:10.1016/j.healthpol.2010.09.009.

Séne, L.M. & Cissé, M. 2015. Catastrophic out-of-pocket payments for health and poverty nexus: evidence from Senegal. *International Journal of Health Economics and Management.* :1-22. DOI:10.1007/s10754-015-9170-4.

Somkotra, T. & Lagrada, L.P. 2009. Which households are at risk of catastrophic health spending: experience in Thailand after universal coverage. *Health Affairs (Project Hope).* 28(3):w467-w478. DOI:10.1377/hlthaff.28.3.w467.

Su, T.T., Kouyaté, B. & Flessa, S. 2006. Catastrophic household expenditure for health care in a low-income society: a study from Nouna District, Burkina Faso. *Bulletin of the World Health Organization.* 84(1):21-27. DOI:doi.org/10.1590/S0042-96862006000100010.

Ukwaja, K.N., Alobu, I., Abimbola, S. & Hopewell, P.C. 2013. Household catastrophic payments for tuberculosis care in Nigeria: incidence, determinants, and policy implications for universal health coverage. *Infecteous Disease of Poverty.* 2(1):21. DOI:doi: 10.1186/2049-9957-2-21.

van Doorslaer, E., O'Donnell, O., Rannan-Eliya, R.P., Somanathan, A., Adhikari, S.R., Garg, C.C., Harbianto, D., Herrin, A.N. et al. 2006. Effect of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. *The Lancet.* 368(9544):1357-1364. DOI:http://dx.doi.org/10.1016/S0140-6736(06)69560-3.

van Doorslaer, E., O'Donnell, O., Rannan-Eliya, R.P., Somanathan, A., Adhikari, S.R., Garg, C.C., Harbianto, D., Herrin, A.N. et al. 2007. Catastrophic payments for health care in Asia. *Health Economics.* 16(11):1159-1184. DOI:10.1002/hec.1209.

Van Minh, H., Kim Phuong, N.T., Saksena, P., James, C.D. & Xu, K. 2013. Financial burden of household out-of pocket health expenditure in Viet Nam: Findings from the National Living Standard Survey 2002–2010. *Social Science & Medicine.* 96(0):258-263. DOI:http://dx.doi.org/10.1016/j.socscimed.2012.11.028.

Wagner, A.K., Graves, A.J., Reiss, S.K., LeCates, R., Zhang, F. & Ross-Degnan, D. 2011. Access to care and medicines, burden of health care expenditures, and risk protection: Results from the World Health Survey. *Health Policy.* 100(2-3):151-158. DOI:10.1016/j.healthpol.2010.08.004.

Wagstaff, A. 2001. *Measuring equity in health care financing: Reflections on and alternatives to the World Health Organization's Fairness of Financing Index.* World Bank Publications.

Wagstaff, A. 2002. Poverty and health sector inequalities. *Bulletin of the World Health Organization.* 80(2):97-105.

Wagstaff, A., Bilger, M., Sajaia, Z. & Lokshin, M. 2011. *Health Protection and Financial Protection.* Washington, D.C.: The World Bank.

Wagstaff, A. & Van Doorslaer, E. 2000. Equity in health care finance and delivery. In *Handbook of Health Economics.* A. Culyer & J. Newhouse, Eds. 1st ed. Amsterdam: Elsevier. 1803-1862.

Wagstaff, A. & van Doorslaer, E. 2003. Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998. *Health Economics.* 12(11):921-933.

Whitehead, M., Dahlgren, G. & Evans, T. 2001. Equity and health sector reforms: can low-income countries escape the medical poverty trap? *The Lancet.* 358(9284):833-836. DOI:http://dx.doi.org/10.1016/S0140-6736(01)05975-X.

WHO, 2010. *The world health report. health system financing.the path to unniversal health.* Geneva: WHO Press.

WHR. 2000. *World Health Report.* Geneva,Switzerland: World Health Organization.

Wyszewianski, L. 1986. Families with Catastrophic Health-Care Expenditures. *Health Services Research.* 21(5):617-634.

Xu, K. 2005. *Distribution of health payments and catastrophic expenditures Methodology.* (2). Switzerland, Geneva: World Health Organization.

Xu, K., Evans, D., Kawabata, K., Zeramdini, R., Klavus, J. & Murray, C. 2003. Household catastrophic health expenditure: a multicountry analysis. *Lancet.* 362(9378):111-117. DOI:10.1016/S0140-6736(03)13861-5.

Xu, K., Evans, D.B., Carrin, G., Aguilar-Rivera, A., Musgrove, P. & Evans, T. 2007. Protecting households from catastrophic health spending. *Health Affairs (Project Hope).* 26(4):972-983. DOI:DOI 10.1377/hlthaff.26.4.972.

Yardim, M.S., Cilingiroglu, N. & Yardim, N. 2010. Catastrophic health expenditure and impoverishment in Turkey. *Health Policy (Amsterdam, Netherlands).* 94(1):26-33. DOI:10.1016/j.healthpol.2009.08.006.

3 Part C: Journal Manuscript

(This manuscript was prepared as per the author's writing instructions for submissions to the journal Health Economics, Policy and Law. See appendix 7).

Assessment of financial catastrophe and impoverishment from out-of-pocket payments in Swaziland

Abstract:

As the drive towards universal coverage is gaining momentum globally, the need for assessing levels of financial health protection in countries, particularity the developing world, has increasingly become important. Swaziland's health financing system performance in terms of ensuring financial health protection is not clearly understood. This paper assesses financial catastrophe and impoverishment from out-of-pocket payments and associated factors that predict them in Swaziland. The Swaziland Household Income and Expenditure Survey (SHIES) for 2009/2010 was used for the analyses. Financial catastrophe was assessed using a variable threshold. Impoverishment was assessed using both a national and $1.25/day international poverty line. Logistic regression models were used to assess factors that predict household vulnerability to financial catastrophe and impoverishment. It emerged that about 9.6 per cent of the Swazi households experienced financial catastrophe while about 1.1 per cent were pushed below the poverty line as a result of out-of-pocket payments. Factors associated with households' vulnerability include; education of the household-head, household size, location, age and household socio-economic status. The findings indicate that financial health protection is not adequate in Swaziland. Thus, there is a need for financing mechanisms that do not place undue hardships on the poor and vulnerable.

Introduction

The call to countries to aim for universal health coverage by the World Health Organization (WHO) has seen financial health protection becoming a priority, particularly, but not exclusively, among low-and middle income countries (WHO, 2010). The World Health Organization has defined Universal Health Coverage (UHC) as ensuring that all people obtain the health services they need, which should be of good quality without suffering financial hardship when paying for them (WHO, 2010). Among others, attaining UHC requires a well-functioning health financing system (McIntyre, 2007). It is the health financing system that determines if people can have access to care without experiencing exorbitant out-of-pocket payments (Brearly, Marten & O'Connell, 2013; WHO, 2010). One of the mechanisms for financing health services is out-of-pocket payments (WHO, 2010). However, this mechanism has negative consequences on households' welfare particularly for the low income groups (McIntyre et al., 2006; Wagstaff & van Doorslaer, 2003; Wagstaff, 2002; Whitehead, Dahlgren & Evans, 2001). The poor suffer the most mainly because they bear the greatest disease burden (Wagstaff & van Doorslaer, 2003). Also, they spend a greater share of their income on food, and thus they are prone to financial hurt even by health care payments that may appear modest (Su, Kouyaté & Flessa, 2006). The major negative consequences of out-of-pocket payments include impoverishment and financial catastrophe.

Out-of-pocket payments are considered catastrophic if they exceed a certain fraction of a household's income. This fraction is assumed as the maximum health costs that could be spent without disrupting the household's standard of living (Wagstaff & van Doorslaer, 2003). As a result of catastrophic health payments households forgo spending on basic necessities like food (O'Donnell et al., 2008; McIntyre et al., 2006). In addition, some households incur debts or even sell productive assets to cope with the payments (Leive & Xu, 2008). Sadly, these coping mechanisms are never sufficient to protect households'

welfare from being disrupted by such costs. Consequently, households may be pushed into poverty or further into poverty for those that are already poor (Whitehead, Dahlgren & Evans, 2001). The detrimental effects of out-of-pocket payments are evident, particularly in developing countries (Kwesiga, Zikusooka & Ataguba, 2015; Chuma & Maina, 2012; Flores et al., 2008). However, many countries still struggle to lower their levels of out-of-pocket payments to negligible levels of 15-20 per cent as per WHO recommendations (McIntyre & Meheus, 2014; Sambo, Kirigia & Orem, 2013). Among the widely recognised hindrances to households protection against the catastrophic and impoverishing effects of out-of-pocket payments includes lack of evidence on the health financing systems performance including financial health protection[1] within countries (WHO, 2010). Evidence of the health financing systems performance is key to inform and guide interventions aimed at addressing the financial protection challenges faced by countries (Sambo & Kirigia, 2014; Knaul et al., 2007). Thus, there is a need to understand health financing systems performance by measuring the levels of households experiencing catastrophe and impoverishment as a result of out-of-pocket payments, and also, to examine the related factors.

Swaziland's health financing system consists of tax payments (estimated to constitute 18 per cent of the total expenditure on health) whilst for profit private health insurances, donors and out-of-pocket payment constitute about 19, 22 and 11 per cent respectively (WHO, 2015b; Mathauer et al., 2008). The government health spending as a percentage of GDP is estimated at 6 per cent whilst about 30 per cent of this is private health expenditure (WHO, 2012).

In Swaziland, 11 per cent as the share of out-of-pocket payments in total health expenditure could be regarded as modest relative to those of other low-income countries, mostly in Africa (WHO, 2015b ; WHO, 2013). However, there have been special cases whereby other countries reported fair health spending levels but still lack adequate

financial health protection for their population (McIntyre & Meheus, 2014). Similar concerns are held about Swaziland particularly because there is limited evidence on how the current health financing systems is adequately ensuring financial health protection which has a bearing on equal access to health care across segments of the population in Swaziland.

Furthermore, to the knowledge of the author, there has not been a study conducted before assessing the levels of financial catastrophe and its impoverishment effects on households in the country. Thus, this study intends to provide evidence in this regard to guide health financing policy in Swaziland. In addition, the study also examined factors associated with households' vulnerability to catastrophe and impoverishment.

Methodology

The data used in the study were from the Swaziland Household Income and Expenditure Survey (SHIES) 2009-2010. The SHIES is a multi-purpose survey conducted on a nationwide basis by the Central Statistical Office of Swaziland (CSO). Out-of-pocket expenditure data include both inpatient and outpatient out-of-pocket payments collected over 1 month period. But for the purposes of reporting annual effects of out-of-pocket payments the expenditure data were annualized (multiplied by 12 months) in the analysis. Households were selected based on a two-stage stratified sampling method. In the first stage, 375 enumeration areas (EAs) were selected with probability proportional to size based on the 2007 population census framework. At the second stage, within each EA, a fixed number of households were selected by systematic random sampling method. The final sample size was 3167 households from which 1378 were urban and 1794 rural (CSO, 2011).

Living standards and out-of-pocket measurement

The household living standard was estimated using total consumption as a proxy for income. Consumption is the most preferred measure due to a number of reasons among which is that, it is stable across time, thus it is more reliable compared to income (Deaton and Zaidi 2002). Adult equivalent scale (AE) was used to adjust expenditure (consumption and out-of-pocket) to reflect per adult equivalent consumption. This method has been used elsewhere (Ataguba & McIntyre, 2012), and is defined as:

equation (1)

$$AE = (s_A + \Phi S_K)^{\theta} \text{ for } \theta \geqslant 0, 0 \leqslant \Phi \leqslant 1$$

where s_A is the number of adults in the household; S_K is the number of children, **Φ** is the cost of children (a measure of the weight accorded to children relative to adults) and θ represents economies of scale. Following recommendations by Deaton and Zaidi (2002), the following values were set; **Φ** = 0.5 and θ = 0.75.

Out-of-pocket payments included all direct costs made by households to formal or informal health care providers in order to access health care services that were not reimbursed by any prepayment scheme.

Assessing financial protection in a health system

The argument underlying the assessment of financial protection is that households and individuals ought not to experience financial hardship as a result of health care utilisation, and this is one of the functions of the health systems (WHO 2010).

The catastrophic and impoverishment methodologies have been used to assess the level of financial health protection in a health system (Wagstaff and van Doorslaer, 2003). When assessing financial catastrophe, households ought not to spend in excess of a given fraction (*z* percent) of their total expenditure on health care out-of-pocket. The methodology by Wagstaff and van Doorslaer uses a fixed threshold for all households

regardless of different income levels. It is argued that ***z*** should be increasing (e.g.,variable) with income such that financial catastrophe is a function of where a household sits in the income ranking (Ataguba, 2012). To achieve the latter, Ataguba, (2012) proposes assessing financial catastrophe using variable thresholds. This method uses a parameter of aversion to inequality to derive rank dependent thresholds such that low-income households are subject to a lower percentage compared to their high-income counterparts. This is consistent with the principle of vertical equity (e.g., equitable treatment of unequals) (Ataguba 2012).

Furthermore, this methodology recognises that poor households are likely to experience financial hurt even from small payments. This study therefore adopts the methodology proposed in Ataguba (2012) for assessing catastrophe. This method has also been applied elsewhere recently (Kwesiga, Zikusooka & Ataguba, 2015).

The catastrophic effects of out-of-pocket payments

Rank-dependent financial catastrophe

If y is total household income, T_i is a household total out-of-pocket payments and $Zcat$ is an initial threshold, then a rank dependent threshold $Z'cat$ can be defined as: (2)

$$Z'_{cat} = w(p{:}\,y) * Z_{cat}$$

where y is a parameter of aversion to inequality, p is a household's percentile and

$w(p{:}\,y) = y\,(1-p)^{y-1}$ for $y \in (0{,}1]$ when $y = 1$, $Z'_{cat} = Z_{cat}$. (3)

Note that in this study, following the Ataguba (2012), $y = 0.8$ for initial thresholds 5, 10, 15, 20 and 25 per cent of total household income.

Let O_i' represents the rank dependent catastrophic overshoot which is the excess payment above threshold such that:

$O_i' = \max\,(0, (T_i/y_i) - Z'_{cat})$. (4)

If E_i' is a measure indicating whether a household exceeds the rank dependent threshold, then $E_i' = 1$ when $O_i' > 0$ and zero otherwise. Then the rank-dependent headcount is estimated as: (5)

$$H'_{cat} = N^{-1}\left(\sum_{i=1}^{N} E'_i\right) = \mu'_{E'}$$

where $\mu'_{E'}$ is the mean of E'_i and N is the total sample size. This measure indicates the percentage of households whose out-of-pocket payments as a fraction of their income exceed the rank dependent threshold.

Rank-dependent catastrophic gap

The rank-dependent catastrophic gap (G'_{cat}), captures deviations from the catastrophic threshold (Z'_{cat}) across all the observations in the quantiles of gross income irrespective of their health payments. The rank-dependent catastrophic gap index is computed as: (6)

$$G'_{cat} = N^{-1}\left(\sum_{i=1}^{N} O'_i\right) = \mu'_{O'}$$

Where $\mu'_{O'}$ is the mean of O'_i (mean of overshoots)

Mean positive rank dependent gap

The mean positive rank dependent gap (PG'_{cat}) indicates the average payment excess made only by those households with catastrophic health expenditures. The index is computed as: (7)

$$PG'_{cat} = \frac{\sum_{i=1}^{N} O'_i}{\sum_{i=1}^{N} E'_i} = \mu'_{o'} \Big/ \mu'_{E'}$$

Worth mentioning is that following what others have done (Akazili, 2012; Ataguba 2012), the catastrophic effects of out-of-pocket payments is assessed using both total food and total non-food expenditure approaches. However, this is not for comparison purposes given that these approaches apply different thresholds levels.

The impoverishing effects of out-of-pocket payments

The impoverishment effect of out-of-pocket is indicated by the proportion of individuals pushed below the poverty line as a result of paying out-of-pocket for health care (Wagstaff and van Doorslaer, 2003).

Pre-payment poverty headcount

If z_{pov}^{pre} = pre-payment poverty line and x_i = individuals $i's$ pre-payment income, then define $P_i^{pre} = 1 \text{ if } x_i < z_{pov}^{pre}$. The pre-payment poverty hadcount is estimated as: (8)

$$H_{pov}^{pre} = \frac{1}{N}\sum_{i=1}^{N} P_i^{pre} = \mu_{P^{pre}}$$

where *N* is the sample size.

Pre-payment poverty gap

The poverty gap $\left(g_i^{pre}\right)$ indicates short fall from the poverty line. Also, the poverty gap can be seen as the costs for eliminating poverty per head relative to the poverty line. This is equal to $x_i - z_{pov}^{pre}$ if $x_i < z_{pov}^{pre}$, and zero otherwise. The associated pre-payment poverty gap is defined as: (9)

$$G_{pov}^{pre} = \frac{1}{N}\sum_{i=1}^{N} g_i^{pre} = \mu_{g^{pre}}$$

Normalized pre-payment poverty gap

The normalized pre-payment poverty gap estimates the amount required to bring those impoverished above the poverty line. This index is estimated as: (10)

$$NG_{pov}^{pre} = \frac{G_{pov}^{pre}}{Z_{pov}^{pre}}$$

Mean positive prepayment poverty gap

The mean positive prepayment poverty gap indicates intensity as it shows the average deficit to reach the poverty line only among the poor. This index is estimated as: (11)

$$MPG_{pov}^{pre} = \sum_{i=1}^{N} g_i^{pre} \Big/ \sum_{i=1}^{N} p_i^{pre} = \mu_{g^{pre}} / \mu_{P^{pre}}$$

To obtain post-payment indices which are analogous to the pre-payment indices, the pre-payment poverty line Z_{pov}^{pre} is replaced by the post-payment poverty line Z_{pov}^{post} and all other superscripts 'pre' by the superscript '$post$'.

Then the poverty impact of out-of-pocket payment is defined as the difference between the relevant pre-payment and post-payment measures shown below:

Impoverishment head count is calculated as; (12)

$$PI^{H} = H_{pov}^{post} - H_{pov}^{pre}$$

Impoverishment gap as; (13)

$$PI^{G} = G_{pov}^{post} - G_{pov}^{pre}$$

Normalized impoverishment gap as; (14)

$$PI^{NG} = NG_{pov}^{post} - NG_{pov}^{pre}$$

Mean positive gap as; (15)

$$MPG^{NG} = MPG_{pov}^{post} - MPG_{pov}^{pre}.$$

In this study poverty was computed using national (E461 per person/per month) and international ($1.25/day) poverty lines. The international poverty line was computed using the 2010 power purchasing parity (PPP) conversion factor of $1= E4.7 calculated based on the Global Purchasing Power Parities and Real Expenditures by The World Bank (World Bank 2008).

Household level factors associated with financial catastrophe and impoverishment

Factors associated with a household incurring catastrophic payments and impoverishment were determined using multivariate logistic regression as used in Knaul et al. (2007). The model is specified as: (16)

$$In\left[\frac{\pi(x)}{1-\pi(x)}\right] = \alpha + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_i x_i$$

Where $\pi(x)$ is the probability that the response variable (catastrophic payment or impoverishment) $Y_i = 1$; α is the constant and β are the coefficient of the predictor variables (x).

Independent variables

The independent variables explored in this study were selected based on previous studies (Séne & Cissé, 2015; Kwesiga, Zikusooka & Ataguba, 2015; Su, Kouyaté & Flessa, 2006; Xu et al., 2003) (see Table 4). The factors included a range of household (income level, household size and location), household-head (sex, employment status and educational level) and individual related factors e.g., age.

Further, since household consumption was used as a measure for household ability to pay, in order to examine any correlation between household living standards and impoverishment from health payments an asset index was constructed. The asset index was generated using principal component analysis (PCA) based on indicators of households' characteristics and assets ownership, e.g., source of drinking water, toilet facility, and car, television and communication gadgets. Stata 12 (Stata Corp 2012) was used in all data analyses.

Table 4. Definition of variables

Variables	Defining variables	Variable description
Household size	Two categories representing the number of people residing in a household	1 = household members are </=5 0 = household members > 5
Sex of household head	Is the household head male or female	0 = male, 1 = female
Household-head education	Educational level of the household-head.	
	1 = no formal education (*reference*)	1 = yes, 0 = no
	2 = primary	1 = yes, 0 = no
	3 = secondary	1 = yes, 0 = no
	4 = tertiary	1 = yes, 0 = no
Household-head employed	Employment status of household-head	1 = yes, 0 = no
Children (<6years)	Household has a child < 6 years.	1 =yes, 0 = no
Elderly (>=60years)	Household has an elderly aged >=60 years.	1 =yes, 0 = no
Socio-economic level presented by quintiles	Household ranking based on the asset index.	1 = poorest (*reference*)
		2 = second poorest
		3 = middle
		4 = second richest
		5 = richest
Household region	Household location in terms of region.	
	1 = Hhohho (*reference)*	1 =yes, 0 = no
	2 = Manzini	1 = yes, 0 = no

	3 = Shiselweni	1 = yes, 0 = no
	4 = Lubombo	1 = yes, 0 = no
Household location	Place of residence of household.	0 = urban, 1 = rural
Type of health-care facility	Type of facility used by household for accessing health care.	
	Public	1=yes, 0 = no (*reference*)
	Private	1=yes, 0 = no
	Mission	1=yes, 0 = no
	Informal care	1 =yes,0 = no

Results

Table 5. Descriptive statistics of some variables used in the analysis

Variables	**N (%)**
Place of residence of household	
Rural	1794 (56.7%)
Urban	1373 (43.4%)
Total	3167 (100%)
Number of households per region	
Hhohho	1015 (32.1%)
Manzini	977 (30.9%)
Lubombo	526 (16.6%)
Shiselweni	649 (20.5%)
Total	3167 (100%)
Sex of household head	
Male	1737 (54.9%)
Female	1430 (45.1%)
Total	3167 (100%)
Household head with at least tertiary education (by sex)	
Female	195 (6.2%)
Male	365 (11.5%)
Total	559 (17.7%)
Household size by location	
>5 members	809 (25.5%) (rural)
< = 5 members	985 (31.1%) (rural)
>5 members	197 (6.2%)(urban)
< = 5 members	1176 (37.1%)(urban)
Total	3167 (100%)
Employment status of household by sex	
Employed (male & female)	1983 (62.6%)

Female	760 (24%)
Male	1223 (38.6%)

Descriptive statistics

Table 5 provides summary statistics for key variables used in the analysis. Of the 3167 households, more than half were male headed (55 per cent) and mostly rural (57 per cent). Also, a large number of the households were from the Hhohho region (32 per cent) whilst the least (17 per cent) came from the Manzini region. In total only 18 per cent of household heads had attained tertiary education and of those only 6 per cent were female. About 32 per cent of households had a large household size (>5 members), and 25 per cent of those households were rural. Finally, more than half of the household heads (63 per cent) were employed and were mostly males (39 per cent) compared to females (24 per cent).

Table 6. Households' catastrophic out of-pocket health expenditures indices

	Total household expenditure				**Total non-food household expenditure**			
Initial thresholds (z)	5%	10%	20%	25%	5%	10%	25%	40%
Headcount	16.8%	9.6%	3.8%	2.3%	24.1%	15.8%	5.9%	2.7%
Gap	1.4%	0.9%	0.4%	0.2%	2.9%	2.1%%	0.87	0.36
Mean positive gap	8.6%	9.4%	10.5%	11.7%	12.1%	13.2%	14.6%	13.2%

Parameter value y = 0.8.

Considering an initial threshold level of 10 per cent for total household expenditure, the catastrophic head count was 9.6 per cent. This means that on average about 9.6 per cent of the Swazi households pay catastrophic payments if the initial threshold is set at 10%. In absolute terms this represents about 99,853 individuals based on an estimated population of about 1 million people (CSO, 2015).

The catastrophic headcount varied with the initial threshold as well as the measure for households' ability to pay. E.g., defining catastrophe using total and non-food expenditure at the 5 per cent initial threshold, about 16.8 per cent and 24.1 per cent households incurred catastrophic payments respectively. A similar trend was shown with respect to the gap measures for both expenditure measures. For total expenditure at the 5 and 10 per cent initial thresholds, households paid out-of-pocket health payments in excess (overshoot) of about 1.4 and 0.9 per cent respectively over and above their rank dependent thresholds. Considering the initial threshold of 10 per cent for total expenditure, the mean positive gap was 9.4 per cent.

A comparison of financial catastrophe using total and non-food household expenditures (Table 6) reveals important differences. E.g., on average, financial catastrophe estimates based on total non-food household expenditure were significantly higher than those based on total household expenditures.

Table 7. Poverty headcounts and gap measures

National poverty line (E461 per person per month)					**International poverty line ($1.25/day)**			
	Gross payment (a)	**Net payment (b)**	**Absolute poverty (c) = (b)-(a)**	**Relative poverty**	**Gross payment (a)**	**Net payment (b)**	**Absolute poverty (c) = (b)-(a)**	**Relative poverty**

Poverty Headcount	62.3%	63.3%	1.1%	1.7%	20.8%	22.5%	1.6%	7.7%
Poverty gap	1662.2	1719.1	56.9	3.4%	145.1	155.9	10.8	7.4%
Normalized gap	30.0%	31.0%	1.0%	3.3%	6.7%	7.2%	0.5%	7.5%
Mean positive gap	48.3%	49.1%	0.8%	1.7%	32.2%	32.0%	0.2%	0.6%

Using the national poverty line (Table 7), poverty head count increased from 62 per cent to 63 per cent due to out-of-pocket payments. This translates to an absolute poverty rise of 1.1 per cent. This represents about 11,441 individuals pushed below the poverty line. This percentage translates to about 1.7 per cent relative poverty increment. The poverty gap on the other hand increased from E1662.2 to E1719. This represents an absolute rise of E56.90 or about 3.4 per cent relative increment.

Expressing the poverty gap as a proportion of the poverty line, the normalised poverty gap increased by 1.0 per cent resulting in a relative rise of 3.3 per cent. The mean positive poverty gap increased by 0.8 per cent representing a relative increment of 1.7 per cent. This means that among those that are originally poor, on average, poverty was deepened further by about 0.8 per cent as a result of out-of-pocket health payments
A similar pattern of increased numbers of individuals pushed below the poverty line as a result of out-of-pocket payments was evident with the international poverty line.

Factors associated with households' vulnerability to catastrophic health expenditure and impoverishment

As shown in Tables Table 8 and Table **9**, a range of variables are associated with households' vulnerability to financial risk. Households with an employed head were about 2 times less likely to experience financial catastrophe ($p<0.01$) while the likelihood for impoverishment was 1.3 times less. However, for impoverishment this was statistically

insignificant at the 5 per cent level. Using private care increased the likelihood of catastrophe by 7.5 times more compared to public care ($p<0.01$), but it was protective against impoverishment ($p<0.05$). Also, belonging to any income quintile other than the poorest was protective against both catastrophe and impoverishment at the 1 per cent level of significance (Table 8 and Table **9**).

Other significant predictors ($p<0.01$; Table 8) for catastrophe, included belonging to the Lubombo region, history of informal care and using mission facilities. For impoverishment ($p<0.01$; Table **9**), rural households were 2 times more likely to get impoverished from out-of-pocket payment than urban households ($p<0.01$). Other positive predictors for impoverishment included having children (5 years or less) ($p<0.01$) and elderly (60 and above) ($p<0.05$) in the household. An educated household-head (with tertiary education) decreased the household's likelihood for experiencing impoverishment. As can be seen from both tables (8 and 9) there were other variables that could predicted financial risk but were statistically insignificant, e.g., household-head sex.

Further, as shown in Appendix 1. Table 10 and Appendix 2. Table 11, similar analysis was also conducted using the total non-food expenditure (for financial catastrophe) and the international poverty line (for impoverishment). There were notable differences and similarities in the results. E.g., belonging to the lowest socio economic quintile continued to increase the likelihood for financial risk in all the models (see Tables 8, 9, 10, and 11), while only for the international poverty line did female-headed household emerged as a predictor for impoverishment ($p<0.05$).

Table 8. Factors associated with catastrophic health expenditure, total expenditure (SHIES 2009/10)

Factors	Odds Ratio	SE

HH-head employed	0.54***	0.10
Sex of HH-head (female vs male)	0.84	0.14
Children	1.04	0.08
Elderly	1.10	0.14
Education level of HH-education (reference No formal education)		
Primary	1.11	0.25
Secondary	1.20	0.36
Tertiary	1.51	0.69
Socio-economic status (reference poorest)		
Second poorest	0.82	0.21
Middle	0.44***	0.12
Second richest	0.55*	0.19
Richest	0.38***	0.13
Households regions (reference Hhohho)		
Manzini	1.47*	0.31
Shiselweni	0.83	0.20
Lubombo	2.20***	0.44
Type of health care facility (reference public)		
Private	7.53***	1.44
Mission	4.18***	1.02
Informal care	11.30	3.60
Location (rural vs urban)	0.87	0.19
HH-size (less than 5 vs greater than 5)	1.22	0.22

Note: Level of significance in asterisks

***p<0.01, **p<0.05, *p<0.1

Table 9. Factors associated with impoverishment, using national PL (SHIES 2009/10)

Note: Level of significance in asterisks

Factors	Odds Ratio	S
HH-head employed	0.78	0.11
Sex of HH-head (female vs male)	0.91	0.91
Children	1.49***	0.11
Elderly	1.40**	0.19
Education level of HH-education (reference No formal education)		
Primary	1.05	0.21
Secondary	0.76	0.15
Tertiary	0.19***	0.07
Socio-economic status (reference poorest)		
Second poorest	0.41***	0.09
Middle	0.24***	0.05
Second richest	0.09***	0.02
Richest	0.03***	0.01
Households regions (reference Hhohho)		
Manzini	1.14	0.20
Shiselweni	0.72	0.15
Lubombo	1.11	0.24
Type of health care facility (Public reference)		
Private	0.63**	0.13
Mission	1.04	0.30
Informal care	0.88	0 .32
Location (rural vs urban)	2.09***	0.31
HH-size (less than 5 vs greater than 5)	0.37***	0.06

***p<0.01, **p<0.05, *p<0.1

Discussion

This study sets out with the aim of assessing financial health protection in Swaziland. The results suggest inadequate financial health protection in Swaziland's health systems, even though the country records a modest share of out-of-pocket health payments in total health expenditure. This is in relation to the minimum accepted levels of 15-20 per cent noted by Word Health Organization (WHO, 2015b). A considerable percentage of households experienced catastrophic health expenditures at all the threshold levels considered. However, the severity significantly decreases with higher threshold levels. Based on previous studies, this may suggest that the burden is heavy among poor households and this has worrying implications on the consumption of essential non-medical necessities for the poor. This is the case as poor households allocate a greater share of their budget to food (O'Donnell et al., 2008; Su, Kouyaté & Flessa, 2006). A similar pattern of findings has been reported from other developing countries (Kwesiga, Zikusooka & Ataguba, 2015; Saksena, Xu & Durairaj, 2010).

In this paper it was estimated that about 1.1 per cent of households (e.g., about 11,441 Swazis) were pushed below the poverty line as a result of out-of-pocket health payments. The findings were comparable to those of other low-income countries in Africa (Mills et al., 2012; Chuma & Maina, 2012). Although this percentage is small, it represents a significant population given the high national poverty rate estimated at 63 per cent (CSO, 2015). Furthermore, using the national poverty line, the mean positive poverty gap was 17 per cent. This means that the increase in poverty caused by out-of-pocket payments was mainly as a result of the previously non-poor households being pushed below the poverty line rather than deepening of poverty for the previously poor households. This shows that the adverse consequence of out-of-pocket health payments occurs across households of different socio-economic status. Similar results have been observed in

earlier studies conducted in other developing countries (Ilunga-Iunga et al., 2015; Akinkugbe, Chama-Chiliba & Tlotlego*, 2012; Ekman, 2007).

While these results are similar in pattern to those of other studies, they may understate the extent of financial catastrophe and impoverishment in Swaziland. This is because of the high national poverty rate and the fact that the country is still placing charges on health care services even at public facilities. Based on literature from elsewhere, in this circumstance the poor may be underutilising health care services as they may not afford payment. They may also modify their perception of illness (McIntyre et al., 2006). This has more devastating consequences to households' welfare (Whitehead, Dahlgren & Evans, 2001). A similar finding emerged in a cross-country study that included Swaziland (Leive & Xu, 2008). However, it is important to note that this study was assessing households' coping mechanisms and not financial catastrophe or impoverishment per se.

A wide range of household characteristics were associated with households' vulnerability to financial risks. Belonging to the poorest quintile was strongly associated with households' likelihood of incurring both financial catastrophe and impoverishment compared to other quintiles. This finding corroborates those by previous studies, which showed that the burden of health care payment was disproportionally more for poor households than their better-off counterparts (Onwujekwe, Hanson & Uzochukwu, 2012; Xu et al., 2003). An unemployed household-head was another predictor of financial risk while being educated (tertiary level) provides a protective effect against impoverishment only.

As expected, private health care utilisation increases the likelihood of financial catastrophe, but surprisingly it was protective against impoverishment. Even though literature on factors associated with impoverishment was limited, majority of previous

studies point out private care as associated with financial catastrophe (Saksena, Xu & Durairaj, 2010; Xu et al., 2006). However, the possible explanation for these results could be that private facilities are mostly utilised by the better-off groups who can afford payment or any form of health insurance (Ataguba & McIntyre, 2013). While these households pay for health care out-of-pocket, which may be financially catastrophic, such payments are not sufficient to impoverish them. Thus, the consequences of out-of-pocket payments may be less for the well-off since they have enough resources e.g., savings compared to poor households (Ataguba & McIntyre, 2013). While on the other hand, the poor are faced with health payments in every facility when there is no coverage by a third party (Mathauer et al., 2008).

This explanation seems to be supported further by findings in this study as it was indicated that the utilisation of any form of health care facility other than public is highly predictive of financial catastrophe. Furthermore, these findings were in accord with most studies investigating financial health protection particularly from low-income countries (Kwesiga, Zikusooka & Ataguba, 2015; Ukwaja et al., 2013). On the other hand, these results indicate that perhaps public charges are the least compared to those by other facilities in Swaziland.

As expected, smaller household size (5 members or less) was protective against impoverishment, and similar findings were shown elsewhere (Brinda, Rodriguez & Enemark, 2014; Knaul et al., 2011). Another important finding from the study concerns the elderly and children. Households living with children (5 year or less) or the elderly (60 and above) are at higher risk for impoverishment and financial catastrophe (using non-food expenditure). This is not surprising because the demand for health care increases with age (Grossman, 2000).

Being a rural resident was shown to be associated with impoverishment. E.g., the most rural and poorest region (Lubombo) was found to be associated with both financial catastrophe and impoverishment (CSO, 2011). These findings are similar to those reported elsewhere (Abu-Zaineh et al., 2013; Knaul et al., 2011). Perhaps rural residency is associated with lower financial capacity and higher probability of ill-health. These two effects mean that rural residents will face a comparatively higher burden of out-of-pocket payments.

What is worth noting, is that when comparing the findings for the total and total non-food expenditure (e.g., for financial catastrophe) as well as those for the national and international poverty lines (e.g., for impoverishment) there were slight differences. E.g., sex of the household-head predicted impoverishment only for the international poverty line. This seems to suggest that factors that increase households' vulnerability to financial risk may vary with the measure of households' welfare and the measure of financial risk protection.

The lack of financial protection in Swaziland as indicated by the results is a cause of concern. This is because it may have adverse consequences on households. There is therefore an urgent need for the country to institute financial risk protection measures to protect households from financial risk, particularly the poor. An example is the use of mandatory prepayment mechanisms that have been recommended by the WHO (McIntyre, 2007) and which have been demonstrated as effective in bringing down the levels of financial risk even in low income countries (McIntyre & Meheus, 2013; Saksena et al., 2011; Nguyen, Rajkotia & Wang, 2011).

The study findings do not only add to the growing body of literature but they also enhance better understanding of the financial health protection status in Swaziland. It serves as a base for future related studies to be conducted in the country. In addition, policy makers

can use the findings demonstrated in this study to better target interventions at those households at risk as shown by this study. Additionally, the study findings could serve as an advocacy tool to politicians for the need to address the lack of financial protection. Further, it has the potential to place financial health protection on top of the Ministry of Health's agenda as it has demonstrated critical, relevant and limited evidence in the country.

A key strength of the study is that financial catastrophe was assessed using variable thresholds other than the conventional uniform threshold used by most previous studies. This methodology has the advantage of explicitly recognising diminishing marginal utility of income and incorporates the principle of vertical equity, which is fundamental in the assessment of fairness in health financing system. Importantly, studies using the variable threshold approach have reported higher estimates compared to those obtained with the uniformed threshold (Ataguba, 2012); signifying an understatement of financial catastrophe.

Limitations

One of the limitations of the study lies in the fact that the methodology employed does not consider those who need services but could not afford. Evidence suggests greater welfare loss among these households compared to those incurring catastrophic payments (Wagstaff et al., 2011). Thus, the estimates reported in this study could be underestimated for that reason. Also, the potential limitations inherited in the use of cross-sectional survey data such as recall bias cannot be disregarded.

On the other hand, findings from the study point to the need to explore factors that increase households' vulnerability to financial risk beyond household-level characteristics. E.g., informal health care utilisation was indicated as increasing the

likelihood of financial catastrophe way more than the use of other health facilities (private, mission and public). It would therefore be worthwhile to explore, within the context of Swaziland, the possible reasons why households use different types of health facilities and how that impact on financial risk protection in order to better inform interventions in future.

Conclusion

The study findings demonstrated that financial health protection is inadequate in Swaziland even though out-of-pocket payments comprise a small share (<15%) of total health finance in the country. It emerged that about 9.6 per cent households incurred financial catastrophe while about 1.1 per cent were impoverished by paying out-of-pocket for health care. Considering the factors that have been identified to increase households' vulnerability to both financial catastrophe and impoverishment, there is, therefore, a need for the country to devise a strategy to prevent and protect such households from financial risk. A reasonable approach to address this problem include targeting interventions at those at risk (e.g., through effective exemption mechanisms). Importantly, the country should rely more on health financing mechanisms that do not impose undue hardships on the poor and vulnerable.

Footnotes

1. The ability of the health systems to protects its population against financial risk as a result of direct health expenditures.

References

Abu-Zaineh, Mohammad, Habiba Ben Romdhane, Bruno Ventelou, Jean-Paul Moatti, and Arfa Chokri. 2013. Appraising financial protection in health: The case of Tunisia. *International Journal of Health Care Finance and Economics* 13 (1) (03): 73-93.

Akinkugbe, Oluyele, Chitalu Chama-Chiliba, and Naomi Tlotlego. 2012. Health financing and catastrophic payments for health care: Evidence from household-level survey data in Botswana and Lesotho. *African Development Review* 24 (4) (12): 358-70.

Ataguba, John Ele-Ojo. 2012. Reassessing catastrophic health-care payments with a Nigerian case study. *Health Economics, Policy and Law* 7 (03): 309-26.

Ataguba, John E., and Di McIntyre. 2012. Paying for and receiving benefits from health services in South Africa: Is the health system equitable? *Health Policy and Planning* 27 (MAR): i35-45.

Ataguba, John Ele-Ojo, and Di McIntyre. 2013. Who benefits from health services in South Africa? *Health Economics, Policy and Law* 8 (01): 21-46.

Barros, Aluisio J. D., Joao Luiz Bastos, and Andrea H. Damaso. 2011. Catastrophic spending on health care in Brazil: Private health insurance does not seem to be the solution. *Cadernos De Saude Publica* 27:S254-62.

Brearly, L., R. Marten, and T. O'Connell. 2013. Universal health coverage: A commitment to close the gap. *New York: Rockefeller Foundation, Save the Children, the United Nations Children's Fund (UNICEF) and the World Health Organization*.

Brinda, Ethel Mary, Andrés Antonio Rodriguez, and Ulrika Enemark. 2014. Correlates of out-of-pocket and catastrophic health expenditures in Tanzania: Results from a national household survey. *BMC International Health & Human Rights* 14 (1) (03): 1-15.

Chuma, Jane, and Thomas Maina. 2012. Catastrophic health care spending and impoverishment in Kenya. *BMC Health Services Research* 12 (3) (03/15): 1-9.

CSO. Central statistical office of Swaziland. 2015 Available from http://www.swazistats.org.sz/ (accessed 2015,July,16).

CSO. 2011. *Poverty in a decade of slow economic growth: Swaziland in the 2000's.* Swaziland: Central Statistical Office, .

Ekman, Björn. 2007. Catastrophic health payments and health insurance: Some counterintuitive evidence from one low-income country. *Health Policy* 83 (2–3) (10): 304-13.

Flores, Gabriela, Jaya Krishnakumar, Owen O'Donnell, and Eddy Van Doorslaer. 2008. Coping with health-care costs: Implications for the measurement of catastrophic expenditures and poverty. *Health Economics* 17 (12) (DEC): 1393-412.

Grossman, Michael. 2000. The human capital model. *Handbook of Health Economics* 1 : 347-408.

Ilunga-Iunga, Felicien, Alain Leveque, Samia Laokri, and Michele Dramaix. 2015. Incidence of catastrophic health expenditures for households: An example of medical attention for the treatment of severe childhood malaria in Kinshasa reference hospitals, Democratic Republic of Congo. *Journal of Infection and Public Health* 8 (2) (MAR-APR): 136-44.

Knaul, Felicia Marie, Héctor Arreola-Ornelas, Oscar Méndez-Carniado, and Ana Cristina Torres. 2007. Impoverishing and catastrophic household health spending among families with older adults in Mexico: A health reform priority. In *The health of aging Hispanics*, 237-262Springer.

Knaul, Felicia,Marie, Rebeca Wong, Hector Arreola-Ornelas, Oscar Mendez, and Network Health Financing Social. 2011. Household catastrophic health expenditures: A comparative analysis of twelve Latin American and Caribbean countries. *Salud Publica De Mexico* 53 : S85-95.

Kwesiga, Brendan, Charlotte M. Zikusooka, and John E. Ataguba. 2015. Assessing catastrophic and impoverishing effects of health care payments in Uganda. *BMC Health Services Research* 15 (1): 30.

Leive, Adam, and Ke Xu. 2008. Coping with out-of-pocket health payments: Empirical evidence from 15 African countries. *Bulletin of the World Health Organization* 86 (11): 849-856C.

Mathauer, I., L. Musango, G. Carrin, and K. Mthethwa. 2008. *Feasibility assessment and financial projection results for a social health insurance scheme in Swaziland.* Geneva: World Health Organisation.

McIntyre, D., and F. Meheus. 2014. *Fiscal space for domestic funding of health and other social services.* London: Chatham House, (accessed 2014, November 18).

McIntyre, Diane. 2007. *Learning from experience: Health care financing in low-and middle-income countries.* Geneva, Switzerland: Global forum for health research Geneva.

McIntyre, D., and F. Meheus. 2013. Achieving sustainable universal health coverage in low- and middle-income countries. *Health Economics, Policy, and Law* 8 (4) (Oct): 543-8.

McIntyre, Diane, Michael Thiede, Göran Dahlgren, and Margaret Whitehead. 2006. What are the economic consequences for households of illness and of paying for health care in low- and middle-income country contexts? *Social Science & Medicine* 62 (4) (2): 858-65.

Mills, Anne, John E. Ataguba, James Akazili, Jo Borghi, Bertha Garshong, Suzan Makawia, Gemini Mtei, et al. 2012. Equity in financing and use of health care in Ghana, South Africa, and Tanzania: Implications for paths to universal coverage. *The Lancet* 380 (9837) (7/14–20): 126-33.

Nguyen, Ha T. H., Yogesh Rajkotia, and Hong Wang. 2011. The financial protection effect of Ghana national health insurance scheme: Evidence from a study in two rural districts. *International Journal for Equity in Health* 10 (JAN 19 2011): 4.

O'Donnell, Owen, Adam Wagstaff, Eddy van Doorslaer, and M. Lindelow. 2008. *Analyzing health equity using household survey data: A guide to techniques and their implementation*. Washington DC: World Bank Publications.

Onwujekwe, Obinna, Kara Hanson, and Benjamin Uzochukwu. 2012. Examining inequities in incidence of catastrophic health expenditures on different healthcare services and health facilities in Nigeria. *Plos One* 7 (7) (JUL 16): e40811.

Saksena, Priyanka, Ke Xu, and Varatharajan Durairaj. 2010. *The drivers of catastrophic expenditure: Outpatient services, hospitalization or medicines.* Geneva: World Health Organization, 21.

Saksena, Priyanka, Adelio Fernandes Antunes, Ke Xu, Laurent Musango, and Guy Carrin. 2011. Mutual health insurance in Rwanda: Evidence on access to care and financial risk protection. *Health Policy* 99 (3) (MAR 2011): 203-9.

Sambo, Luis Gomes, and Joses Muthuri Kirigia. 2014. Investing in health systems for universal health coverage in Africa. *BMC International Health and Human Rights* 14 (OCT 28): 28.

Sambo, Luis Gomes, Joses Muthuri Kirigia, and Juliet Nabyonga Orem. 2013. Health financing in the African region: 2000-2009 data analysis. *International Archives of Medicine* 6 (1) (2013): 10.

Séne, Ligane Massamba, and Momath Cissé. 2015. Catastrophic out-of-pocket payments for health and poverty nexus: Evidence from Senegal. *International Journal of Health Economics and Management*: 1-22.

Su, Tin Tin, Bocar Kouyaté, and Steffen Flessa. 2006. Catastrophic household expenditure for health care in a low-income society: A study from Nouna district, Burkina Faso. *Bulletin of the World Health Organization* 84 (1): 21-7.

Ukwaja, Kingsley Nnanna, Isaac Alobu, Seye Abimbola, and Philip Christy Hopewell. 2013. Household catastrophic payments for tuberculosis care in Nigeria: Incidence, determinants, and policy implications for universal health coverage. *Infecteous Disease of Poverty* 2 (1): 21.

Van Minh, Hoang, Nguyen Thi Kim Phuong, Priyanka Saksena, Chris D. James, and Ke Xu. 2013. Financial burden of household out-of-pocket health expenditure in Vietnam: Findings from the national living standard survey 2002–2010. *Social Science & Medicine* 96 (0) (11): 258-63.

Wagstaff, Adam. 2002. Poverty and health sector inequalities. *Bulletin of the World Health Organization* 80 (2): 97-105.

Wagstaff, Adam, Marcel Bilger, Zurab Sajaia, and Michael Lokshin. 2011. *Health protection and financial protection*. Washington, D.C.: The World Bank.

Wagstaff, Adam, and Eddy van Doorslaer. 2003. Catastrophe and impoverishment in paying for health care: With applications to Vietnam 1993–1998. *Health Economics* 12 (11): 921-33.

Whitehead, Margaret, Göran Dahlgren, and Timothy Evans. 2001. Equity and health sector reforms: Can low-income countries escape the medical poverty trap? *The Lancet* 358 (9284) (9/8): 833-6.

WHO. 2015. *National health accounts database.* Geneva, Switzerland: World Health Organisation.

WHO. 2013. *State of health financing in the African region.* Brazzaville, Congo: World Health Organization regional office for Africa.

WHO. 2010. *The world health report. Health system financing. The path to universal health.* Geneva: WHO Press.

World Bank. 2008. Global purchasing power parities and real expenditures; 2005 international comparison program. Washington, D.C.: World Bank.

Xu, Ke, David B. Evans, Patrick Kadama, Juliet Nabyonga, Peter Ogwang Ogwal, Pamela Nabukhonzo, and Ana Mylena Aguilar. 2006. Understanding the impact of eliminating user fees: Utilization and catastrophic health expenditures in Uganda. *Social Science & Medicine* 62 (4): 866-76.

Xu, K., DB Evans, K. Kawabata, R. Zeramdini, J. Klavus, and CJL Murray. 2003. Household catastrophic health expenditure: A multicountry analysis. *Lancet* 362 (9378) (JUL 12): 111-7.

4 Part D: Policy brief

POLICY BRIEF

The adverse effects on households paying out-of-pocket for health care in Swaziland

Highlights

- About 9.6% (99,853) of Swazi households spend more than 10% of their total expenditure paying out-of-pocket for health care.
- 11,441 individuals face financial hardship as a result of paying out-of-pocket for health care.
- The adverse consequences for paying out-of-pocket for health are severe among poor households compared to better-off households.
- Use of health facilities other than public facilities increases households' vulnerability for suffering financial risk. Thus, there is an urgent need for concerted efforts and strategies aimed at protecting households from the adverse effects of paying out-of-pocket for health care.

Introduction

Swaziland is among countries that has committed toward achieving the ambitious goal of Universal Health Coverage by 2025 (WHO, 2015a). Universal Health Coverage is defined as ensuring that all people obtain the health services they need, which should be of good quality without suffering financial hardship when paying for them (McIntyre, 2007). Health financing is an important element of the broader effort toward attaining universal health coverage, and out-of-pocket payment is one of the mechanisms of health financing. However, the World Health Organization calls on countries to move away from relying on this form of health care financing to prepayment mechanisms, that is, contributing to health care before the need to use health care services arises.

Out-of-pocket health care payments have implications for access to and utilization of health services particularly among the poor. This is because out-of-pocket health financing places emphasis on service provision on condition that individuals can afford payments, yet the poor who tend to need more health care services cannot afford such payments. Those who may manage to pay usually forgo spending on basic needs (e.g., food and shelter) and consequently incur financial catastrophe[14]. In addition to catastrophe, poor households can become poorer while the non-poor run the risk of being impoverished (getting into poverty[15]) as a result of such payments. In many cases, households never recover from the catastrophic and impoverishing effects of paying out-of-pocket for health care.

To mitigate the adverse consequences of out-of-pocket health care payments some households may resolve to not seeking health care services at all or sell productive assets to afford payment. However, these actions are associated with greater adverse effects on households' welfare compared to those who incurred catastrophe (Su, Kouyaté & Flessa, 2006).

[14] Health payments exceed a certain fraction of the household's resources such that spending on other basic needs, e.g., food and shelter can no longer be affordable.

[15] Poverty is defined as deprivation of wellbeing and lack of command over basic commodities like food and water.

It is estimated that about 11% of total health expenditure in Swaziland is out-of-pocket payments. All facilities (private, public and mission) in the country still charge for service provision, however the costs vary with the type of facility used. This suggests that the potential exists for households to suffer the adverse consequences associated with paying for health care out-of-pocket. To further exacerbate issues, the country still lacks a mandatory prepayment mechanism. Prepayment mechanisms, do not only offer households greater protection against the adverse consequences of paying out-of-pocket for health services, but they are also considered as the most practical means for countries to move toward achieving universal health coverage (WHO, 2015).

Using data from the Swaziland Household Income and Expenditure Survey (SHIES) 2009/2010, this study investigates the level to which paying for health care out-of-pocket adversely affects households in Swaziland. In addition, the study investigates factors that increase households' vulnerability to these adverse effects. The major adverse effects are impoverishment and financial catastrophe from paying out-of-pocket for health services.

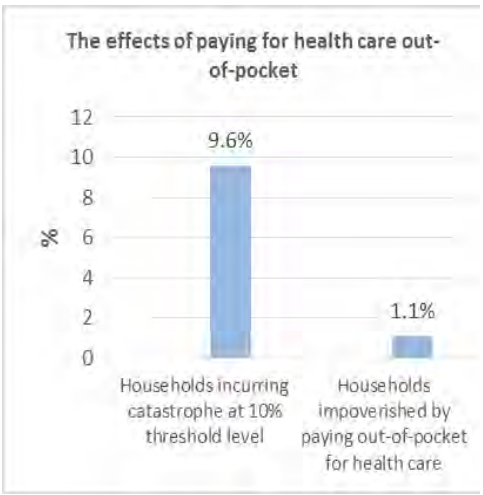
Findings

Households incurring financial catastrophe

In 2009/2010 about 9.6% of Swazi households experienced financial catastrophic health expenditure. This means that these households spend in excess of 10% of their total consumption expenditure paying out-of-pocket for health care. This represents over 99,000 Swazis being deprived of the opportunity to be able to meet basic needs.

Figure 3, indicates a proportion of households spending more than 10% of their total consumption expenditure paying out-of-pocket for health care and proportion of those who got impoverished by such payments.

Figure 3. The effects of paying for health care out-of-pocket.



Impoverishment effects of out-of-pocket payments

Although about 62% of the Swazi population is poor, paying for health care out-of-pocket puts an additional 1.1% of the population into poverty in the country (see figure 3). This represents over 11,000 Swazis. This population were non-poor before paying for health care. If they had not financed health care out-of-pocket, they will not become poor. Also, a substantial number of Swazi population who were previously poor became even poorer as a result of such payments.

Which households are likely to incur financial risk as a result of out-of-pocket payments?

Many factors are associated with households' vulnerability to financial risk in Swaziland. Households that use private facilities, informal care, and mission facilities are at risk. This is especially the case for the use of informal care. Also, households living with children (5 years or less) or elderly (60 years or above) are more likely to incur financial risks. Such vulnerability varies by region of residence. Living in Lubombo increases this risk compared to living in Hhohho, Manzini and Shiselweni regions. The results of the Shiselweni region, one of the poorest in the country, may signify that households in that region are not utilising health care services and as such not incurring any costs.

On the other hand, households with an educated and employed household heads are less likely to incur financial risk. Similarly, a small household size (5 or less members) is protective against incurring financial risk.

Policy recommendations

Direct out-of-pocket payments do not only disrupt households' welfare but also serve as a stumbling block toward the country achieving universal coverage. Therefore, there is

a need for concerted efforts to address the adverse consequences of paying out-of-pocket for health care highlighted by the study findings. Financial catastrophe is directly linked to direct out-of-pocket payments. Thus, if households are to be protected from the adverse effects of paying out-of-pocket for health care, efforts should be directed toward the following measures;

- Implementing financial risk protection strategies targeting the most at risk households to catastrophe. Such strategies may include exemption mechanisms. The strategies should be guided by clear and practical operational steps if maximum potential gains are to be realized.

- Minimizing direct payment at the point of care considerably by ensuring that access to essential health care services is not dependent on ability to pay. This can be achieved by adopting mandatory prepayment mechanisms such as National Health Insurance

References

CSO 2011. *Poverty in a decade of slow economic growth: Swaziland in the 2000's.* Swaziland: Central Statistical Office.

Earl-Slate, A. 1999. *Dictionary of health economics.* 18 Marcham Road, Abingdon, United Kingdom: Redcliffe Medical Press Ltd.

McIntyre, D. 2007. *Learning from experience: Health care financing in low-and middle-income countries.* Geneva, Switzerland: Global forum for health research Geneva.

Su, T.T., Kouyaté, B. & Flessa, S. 2006. Catastrophic household expenditure for health care in a low-income society: a study from Nouna District, Burkina Faso. *Bulletin of the World Health Organization.* 84(1):21-27. DOI:doi.org/10.1590/S0042-96862006000100010.

Wagstaff, A. & van Doorslaer, E. 2003. Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998. *Health Economics.* 12(11):921-933.

WHO 2015. *African Health Ministers Reaffirm their Commitnent to make the Continent Healthy. Luanda Declaration adopted
<**br />.* Available: http://www.afro.who.int/en/media-centre/pressreleases/item/6483-african-health-ministers-reaffirm-their-commitment-to-make-the-continent-healthy-luanda-declaration-adopted.html [2015, August 2].

Disclaimer: The photographs used in this policy brief are for illustrative purposes only and they are publicly available.

5 Part E: Appendices

5.1 Appendix 1. Table 10. Factors associated with catastrophic health expenditure, total non-food expenditure (SHIES 2009/10)

Factors	Odds Ratio	SE
HH-head employed	0.54**	0.13
Sex of HH-head (female vs male)	0.73	0 .18
Children	1.06	0.11
Elderly	1.33	0.25
Education level of HH-education (reference no formal education)		
Primary	1.11	0.52
Secondary	0.33**	0.87
Tertiary	3.82	4.71
Socio-economic status (reference poorest)		
Second poorest	0.78	0.26
Middle	0.33***	0.12
Second richest	0.32*	0.21
Richest	0.06***	0.06
Households regions (reference Hhohho)		
Manzini	1.08	0.42
Shiselweni	0.69	0.30
Lubombo	2.66***	0.87
Type of health care facility (reference public)		
Private	3.87***	1.40
Mission	4.65***	1.90
Informal care	9.80***	4.47
Location (rural vs urban)	1.38	0.49
HH-size (less than 5 vs greater than 5)	1.57	0.50

Note: Level of significance in asterisks

***p<0.01, **p<0.05, *p<0.1

5.2 Appendix 2. Table 11, Factors associated with impoverishment, using International PL (SHIES 2009/10)

Factors	Odds Ratio	SE
HH-head employed	0.74*	0.12
Sex of HH-head (female vs male)	1.38**	0.22
Children	1.13*	0.07
Elderly	1.01	0.12
Socio-economic status (reference poorest)		
Second poorest	0.44***	0.08
Middle	0.20***	0.05
Second richest	0.09***	0.03
Richest	0.01***	0.01
Households regions (reference Hhohho)		
Manzini	1.19	0.32
Shiselweni	0.65	0.19
Lubombo	1.22	0.36
Type of health care facility (reference public)		
Private	0.60**	0.14
Mission	0.68	0.18
Informal care	0.37	0.24
Location (rural vs urban)	3.58***	0.96
HH-size (less than 5 vs greater than 5)	0.30***	0.05

Note: Level of significance in asterisks

***p<0.01, **p<0.05, *p<0.1

5.3 Appendix 3. Principal Component Analysis

This sections aims to offer a description of the principal component analysis (PCA) method used in the study to construct the socio-economic status (SES) indices. A detailed explanation on the technique can be found in (Vyas & Kumaranayake, 2006).

PCA is a multivariate statistical technique that reduces the number of variables in a data set into a smaller number of dimensions to obtain a linear combination of original variables that explains the variability in the original variables. The subsets of the original variables are coherent and they are called principal components. The weight for each principal component is given by eigenvectors[16] while the variance is given by eigenvalues[17] of the corresponding eigenvector of a correlation or covariance matrix of the given variables. The first principal component (PC_1) explains the largest possible amount of variation in the original data. Successive components are uncorrelated to the previous component thus explaining a completely different dimension of the data. This means that even smaller proportion of the variation in the original variables is explained hence, the common application of this technique among other reasons.

The correlation matrix of the set of variables reflected by each principal component can be illustrated as below.

Given a set of variables $X_1, .., X_n$

$$\mathrm{PC}_1 = a_{11}X_1 + a_{12}X_2 + \cdots + a_{1n}X_n$$

$$\mathrm{PC}_m = a_{m1}X_1 + a_{m2}X_2 + \cdots + a_{mn}X_n$$

[16] Eigenvectors are set of functions (coefficients) that describe data variability.
[17] Eigenvalues is a measure of data variability in in a correlation or covariance matrix of given random variables

where a_{mn} represents the weight for the mth principal component and the nth variable. The asset index, A_i, for individual i is defined below as follows: (method adapted from O'Donnell et al., (2008)).

$$A_i = \sum_k \left[f_k \frac{(a_{ik} - \overline{a}_k)}{S_k} \right]$$

Where:

–a_{ik} is the value of asset k to household i

–$\overline{a}_k$ is the sample mean

– $S_k$is the sample standard deviation

–f_k are the weights associated with the first principal component

References

O'Donnell, O., Wagstaff, A., van Doorslaer, E. & Lindelow, M. 2008. *Analyzing health equity using household survey data: a guide to techniques and their implementation.* Washington DC: World Bank Publications.

Vyas, S. & Kumaranayake, L. 2006. Constructing socio-economic status indices: how to use principal components analysis. *Health Policy and Planning.* 21(6):459-468. DOI:10.1093/heapol/czl029.

5.4 Appendix 5. Logistic regression model

This is a statistical method used to predict the odds of an event occurring based on the values of the predictor variables. Thus if $\pi(x)$ is a probability of an event occurring at household i with household characteristics x, then the odds ratio (OR) is given as;

$$OR = \frac{\pi(x)}{(1-\pi(x))}$$

$OR = 0$ if $\pi(x) = 0$ and $OR = \infty$ if $\pi(x) = 1$

In this study if OR > 1 then the factor or variable being considered indicates households vulnerability to financial risk while if OR < 1 indicated less likelihood (protection against the households vulnerability to financial risk).

If X_i represent the control variables in the model and β represent the constant parameters (coefficients), therefore applying a logit transformation to the linear probability model (LPM[18]) the model shall be obtained as

$$In\left[\frac{\pi(x)}{1-\pi(x)}\right] = \alpha + \beta_1\chi_1 + \beta_2\chi_2 + \cdots + \beta_i\chi_i$$

where $\pi(x)$ is the probability that the response variable (catastrophic payment or impoverishment) $Y_i = 1$; α is the constant and β are the coefficient of the predictor variables X_i used in the regression. (The logistic model was adapted from (O'Donnell et al., 2008)).

[18] LMP is similar to linear regression model but the dependent variable is binary.

References

O'Donnell, O., Wagstaff, A., van Doorslaer, E. & Lindelow, M. 2008. *Analyzing health equity using household survey data: a guide to techniques and their implementation.* Washington DC: World Bank Publications.

5.5 Appendix 6. UCT Human Research Ethics Approval

UNIVERSITY OF CAPE TOWN
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Human Research Ethics Committee

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24 April 2015

HREC REF: 222/2015

Dr J Ataguba
Health Economics Unit
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Falmouth Building

Dear Dr Ataguba

PROJECT TITLE: FINANCIAL PROTECTION IN SWAZILAND: AN ASSESSMENT OF FINANCIAL CATASTROPHE AND IMPOVERISHMENT FROM OUT-OF-POCKET HEALTH PAYMENTS (Masters Candidate - C Ngcamphalala)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee for review.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30th April 2016.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.
(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

Please quote the HREC REF in all your correspondence.

We acknowledge that the student Cebisile Ngcamphalala will also be involved in this study.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Yours sincerely

pp Signed

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE
Federal Wide Assurance Number: FWA00001637.
Institutional Review Board (IRB) number: IRB00001938
This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical Research Council (MRC-SA), Food and Drug Administration (FDA-USA), International Convention on Harmonisation Good Clinical Practice (ICH GCP), South African Good Clinical Practice Guidelines (DoH

5.6 Appendix 7. Instructions for authors for Journal publication

CAMBRIDGE | Instructions for Contributors

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In published articles where statistical analysis of original data has been conducted, contributors are expected to provide a replication data set that can be accessed via the electronic version of *Health Economics, Policy and Law*. Mathematical appendices may also be deposited with the *HEPL* website.

Style Sheet

1. Manuscripts should be clearly typed in double spacing and should have a left-hand margin of at least 25 mm/1 inch and a right-hand margin of at least 40mm/1.5 inches. Type size should be no smaller than 12 points. Contributors are asked to retain an exact replica themselves for use in answering copy-editor's enquiries and correcting proofs.

2. Footnotes should be numbered consecutively (in superscript) within the text and listed in a separate section at the end of the article before the References.

3. *Referencing*. Authors must use the author-date system of referencing as described in The Chicago Manual of Style, 15th Edition, (The University of Chicago Press, 2003). In this system citations in the text and footnotes list the author's surname and the year of publication of the work in parentheses. Eg. (Sen and Williams, 1963). Where there are three or more authors, list the first author's surname, followed by et al. and the year of publication. The full list of cited references is then provided alphabetically at the end of the article. References should contain, in the case of books, the names of authors as they appear on the title page, the year of publication, the full title including any subtitle, the place of publication and the name of the publisher, and in the case of articles, the name(s) of the author(s), the year of publication, the full title of the article, the name of the journal, the volume and issue numbers, and the page reference (number of first and last page).

   Le Grand, J. (2003), *Motivation, agency and public policy: of knights & knaves, pawns & queens*. Oxford: Oxford University Press.

   Harsanyi, J.C. (1982), 'Morality and the theory of rational behaviour', in A. Sen and B. Williams (Eds), *Utilitarianism and beyond*. Cambridge: Cambridge University Press.

   Arrow, K.J. (1963), 'Uncertainty and the welfare economics of medical care', *American Economic Review*, 53(5): 941-73.

4. Tables and Figures. Each table and figure should be on a separate sheet, numbered and collected together at the end of the article, after the References. Their place in the text should be indicated by a space and the words 'Table X (Figure X) about here'. Tables should be clearly laid out and designed to fit into a space 190 x 120mm. Vertical lines between columns should be omitted, and horizontal lines limited to the top and bottom of the table, with an additional line below the column headings. Totals and percentages should be labeled, and units identified. Figures should not contain more detail than can be clearly shown in a space 190 x 120mm.

   Charges apply for all colour figures that appear in the print version of the journal. At the time of submission, contributors should clearly state whether their figures should appear in colour in the online version only, or whether they should appear in colour online *and* in the print version. There is no charge for including colour figures in the online version of the Journal but it must be clear that colour is needed to enhance the meaning of the figure, rather than simply being for aesthetic purposes. If you request colour figures in the printed version, you will be contacted by CCC-Rightslink who are acting on our behalf to collect Author Charges. Please follow their instructions in order to avoid any delay in the publication of your article.

5. *Spelling*: Please use English rather than American spelling. In general use the spelling –ise/isation rather than –ize/ization (eg. organise/organisation). *Capitals*:

Please keep these to a minimum and be consistent throughout the manuscript. *Italics* should be used for foreign words except proper names and words (such as role, elite) that have entered common English usage. The use of italics for emphasis is discouraged. *Abbreviations*: Omit full stops in abbreviations consisting of capital letters (USA) and use capitals for acronyms (WHO). Use eg. instead of 'for example' and ie. instead of 'that is'. *Dates* should be in the form 1 May 1968; 1990s (no apostrophe); the twentieth century. *Numbers* up to ten should normally be spelt out, except for percentages, exact quantities or a series of numbers. Use 'per cent' (not %) except in tables. Include a comma in numbers over 999.

6. To ensure a fair and anonymous peer review process, authors should not allude to themselves as the authors of their article in any part of the text. This includes citing their own previous work in the references section in such a way that identifies them as the authors of the current work.

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5.7 Appendix 8: Swaziland Household Income Expenditure Survey Questionnaire (2009/2010)

KINGDOM OF SWAZILAND

CENTRAL STATISTICAL OFFICE

2009/10 SWAZILAND HOUSEHOLD INCOME AND EXPENDITURE SURVEY QUESTIONNAIRE

IDENTIFICATION

NAME OF HEAD OF HOUSEHOLD . . . . . .

ENUMERATION AREA NUMBER. . . . . .

REGION (HHOHHO = 1, MANZINI = 2, SHISELWENI = 3, LUBOMBO = 4) . . . . . .

INKHUNDLA. . . . . .

MAJOR AREA . . . . . .

SUB-AREA . . . . . .

URBAN/RURAL (URBAN = 1, RURAL = 2) . . . . . .

HOMESTEAD NUMBER . . . . . .

HOUSEHOLD NUMBER . . . . . .

		D D M M Y Y	RESULT		D D M M Y Y	RESULT		D D M M Y Y	RESULT
DATE OF INTERVIEW	1ST VISIT			6TH VISIT			11TH VISIT		
	2ND VISIT			7TH VISIT			12TH VISIT		
	3RD VISIT			8TH VISIT			13TH VISIT		
	4TH VISIT			9TH VISIT			14TH VISIT		
	5TH VISIT			10TH VISIT			15TH VISIT		

*RESULT CODES:

1 DWELLING NOT FOUND
2 COMPLETED
3 PARTLY COMPLETED
4 REFUSED
5 OTHER _____ (SPECIFY)

SUPERVISOR

NAME _____

DATE _____

SECTION A: HOUSEHOLD SCHEDULE

Now we would like some information about the people who usually live in your household or who are staying with you now.

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	IF AGE 3 YEARS AND ABOVE			
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household. AFTER LISTING NAMES, RELATIONSHIPS, AND SEX, *THEN ASK APPROPRIATE* QUESTIONS IN COLUMNS FOR EACH MEMBER OF THE HOUSEHOLD.	What is the relationship of (NAME) to the head of the household? SEE CODES BELOW	Is (NAME) male or female? MALE = 1 FE-MALE = 2	Does (NAME) usually live here? YES = 1 NO = 2	Did (NAME) stay here last night? YES = 1 NO = 2	How old is (NAME)? IN YEARS	LITERACY	SCHOOL ATTENDANCE AND HIGHEST LEVEL COMPLETED		
							Can ... read and write? YES = 1 NO = 2	Has ... ever attended preschool, school or literacy program? YES = 1 NO = 2	What is the highest level of school ...attended?	What is the highest (grade/ form/ number of ...) years completed at that level?
(A01)	(A02)	(A03)	(A04)	(A05)	(A06)	(A07)	(A08)	(A09)	(A10)	(A11)
01								Y N DK 1 2 8 GO TO ED04		
02								1 2 8 GO TO ED04		
03								1 2 8 GO TO ED04		
04								1 2 8 GO TO ED04		
05								1 2 8 GO TO ED04		
06								1 2 8 GO TO ED04		
07								1 2 8 GO TO ED04		
08								1 2 8 GO TO ED04		
09								1 2 8 GO TO ED04		
10								1 2 8 GO TO ED04		

CODES FOR Q. A3
RELATIONSHIP TO HEAD OF HOUSEHOLD:
01 = HEAD
02 = WIFE OR HUSBAND/ PARTNER
03 = SON OR DAUGHTER
04 = BROTHER OR SISTER
05 = NIECE/NEPHEW BY BLOOD
06 = GRANDCHILD
07 = PARENT
08 = OTHER RELATIVE
09 = NON-RELATIVE
98 = DON'T KNOW

CODES FOR Q. A10
HIGHEST LEVEL ATTENDED
0 = PRE-SCHOOL
1 = LITERACY PROGRAM
2 = LOWER PRIMARY (GRD 1 TO STD 2)
3 =HIGHER PRIMARY (STD 3-5)
4 = SECONDARY
5 = HIGH SCHOOL
6 = COLLEGE
7 = UNIVERSITY

CODES FOR: Q. A11

PRE-SCHOOL = 00			
LITERACY PROGRAM:			
LP. 1 01		SEC/HIGH SCH.	UNIV. 5+ 19
LP. 2+ 02		FORM. 1 10	GOVT. COLL.
PRIMARY		FORM. 2 11	CG.1 20
GRD 1 03		FORM. 3 12	CG.2 21
GRD 2 04		FORM. 4 13	CG.3+ 22
STD. 1 05		FORM. 5 14	PRIVATE COLL.
STD. 2 06		FORM. 6 15	CG.1 23
STD. 3 07		UNIVERSITY	CG.2 24
STD. 4 08		UNIV. 1 16	CG.3+ 25
STD. 5 09		UNIV. 2 17	VOCATIONAL
		UNIV. 3 18	VOC.1 26
		UNIV. 4 19	VOC.2+ 27

	IF AGE 3 YEARS AND ABOVE					
LINE NO.	Did NAME attend school/academic institution in the last school year?	What grade was NAME attending last school year?	Is NAME currently attending school? IF SCHOOL IS NOT IN SESSION NOW, ASK: Did NAME attend school in the session just completed or plans to attend the next session?	Why did NAME stop or never attended school? LIST THE TWO MOST IMPORTANT REASONS CODE 13 SELECTED SKIP TO NEXT LINE	What grade is NAME currently doing?	Who owns the school NAME is currently attending?
(A01)	(ED 01)	(ED 02)	(ED 03)	(ED 04)	(ED 05)	(ED 06)
	Y N DK 1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			
	1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			
	1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			
	1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			
	1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			
	1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			
	1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			
	1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			
	1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			
	1 2 8 GO TO ED 03		Y N 1 2 GO TO ED 05			

CODES FOR ED 04

STILL TOO YOUNG TO ATTEND SCHOOL 01
NO MONEY FOR SCHOOL COSTS 02
SCHOOLS ARE OF POOR QUALITY 03
OWN ILLNESS/DISABILITY 04
FAMILY ILLNESS/DISABILITY 05
NOT INTERESTED, LAZY 06
DISALLOWED BY PARENTS 07
HAD TO WORK TO HELP AT HOME 08
SCHOOL TOO FAR FROM HOME 09
PREGNANT 10
COULD NOT FIND A PLACE 11
OTHER (SPECIFY) 12
COMPLETED SCHOOL 13

CODES FOR: Q. ED02 & ED 05

PRE-SCHOOL = 00

LITERACY PROGRAM:
LP. 1 01
LP. 2+ 02

PRIMARY
GRD 1 03
GRD 1 04
STD. 1 05
STD. 2 06
STD. 3 07
STD. 4 08
STD. 5 09

SEC/HIGH SCH.
FORM. 1 10
FORM. 2 11
FORM. 3 12
FORM. 4 13
FORM. 5 14
FORM. 6 15

UNIVERSITY
UNIV. 1 16
UNIV. 2 17
UNIV. 3 18
UNIV. 4 19
UNIV. 5+ 19

GOVT. COLL.
CG.1 20
CG.2 21
CG.3+ 22

PRIVATE COLL.
CG.1 23
CG.2 24
CG.3+ 25

VOCATIONAL
VOC.1 26
VOC.2+ 27

CODES FOR ED 06

GOVERNMENT . . 0
MISSION 02
PRIVATE 03

LINE NO.	IF AGE 3 YEARS AND ABOVE How much was spent on NAME'S education in the last 12 months by members of your household on the following items? IF NOTHING WAS SPENT, WRITE ZERO								Did any person outside your household contribute to NAME'S education expenses? YES. . . 1 NO. . . . 2 → GO TO NEXT LINE	Who contributed to NAME'S expenses? RELATIVE. .1 GOVT.. . . . .2 NGO. . . . . .3 OTHER. . . . 4	What was the value of this assistance received in the last 12 months? INCLUDE VALUE OF IN KIND
	tuition/ school fees SZL	books & stationery SZL	uniform, shoes SZL	boarding fees SZL	examination fees SZL	transport SZL	Other educational expenses SZL	Total SZL			SZL
(A01)	(ED 07)	(ED 08)	(ED 09)	(ED 10)	(ED 11)	(ED 12)	(ED 13)	(ED 14)	(ED 15)	(ED 16)	(ED 17)
									☐	☐	
									☐	☐	
									☐	☐	
									☐	☐	
									☐	☐	
									☐	☐	
									☐	☐	
									☐	☐	
									☐	☐	
									☐	☐	

SECTION A (Cont.) : HOUSEHOLD SCHEDULE

LINE NO.	IF AGE 18-59 YEARS	IF AGE 0-17 YEARS						
	SICK PERSON	SURVIVORSHIP AND RESIDENCE OF BIOLOGICAL PARENTS						
	Has (NAME) been very sick for at least three months during the past 12 months? By very sick I mean that (NAME) was too sick to work or do normal activities around the house for at least three of the past 12 months. YES = 1 NO = 2 DK = 8 NR = 9	Is (NAME)'s natural mother alive?	Does (NAME)'s natural mother live in this house-hold? IF YES: What is her name? RECORD MOTHER'S LINE NO. BELOW.	IF MOTHER DOES NOT LIVE IN HOUSEHOLD Has (NAME)'s mother been very sick for at least 3 months during the past 12 months? By very sick I mean too sick to work or do normal activities around the house for at least three of the past 12 months? YES = 1 NO = 2 DK = 8 NR = 9	Is (NAMES)'s mother still sick? YES = 1 NO = 2 DK = 8 NR = 9	Is (NAME)'s natural father alive?	Does (NAME)'s natural father live in this household? IF YES: What is his name? RECORD FATHER'S LINE NO. BELOW.	IF FATHER DOES NOT LIVE IN HOUSEHOLD Has (NAME)'s father been very sick for at least 3 months during the past 12 months? By very sick I mean too sick to work or do normal activities around the house for at least three of the past 12 months? YES = 1 NO = 2 DK = 8 NR = 9
(A01)	(A12)	(A13)	(A14)	(A15)	(A16)	(A17)	(A18)	(A19)
01	☐	Y N DK 1 2 8 GO TO A17	☐☐	Y N DK 1 2 8 GO TO A 17	☐	Y N DK 1 2 8 GO TO A21	☐☐	Y N DK 1 2 8 GO TO A 21
02	☐	1 2 8 GO TO A17	☐☐	1 2 8 GO TO A 17	☐	1 2 8 GO TO A21	☐☐	1 2 8 GO TO A 21
03	☐	1 2 8 GO TO A17	☐☐	1 2 8 GO TO A 17	☐	1 2 8 GO TO A21	☐☐	1 2 8 GO TO A 21
04	☐	1 2 8 GO TO A17	☐☐	1 2 8 GO TO A 17	☐	1 2 8 GO TO A21	☐☐	1 2 8 GO TO A 21
05	☐	1 2 8 GO TO A17	☐☐	1 2 8 GO TO A 17	☐	1 2 8 GO TO A21	☐☐	1 2 8 GO TO A 21
06	☐	1 2 8 GO TO A17	☐☐	1 2 8 GO TO A 17	☐	1 2 8 GO TO A21	☐☐	1 2 8 GO TO A 21
07	☐	1 2 8 GO TO A17	☐☐	1 2 8 GO TO A 17	☐	1 2 8 GO TO A21	☐☐	1 2 8 GO TO A 21
08	☐	1 2 8 GO TO A17	☐☐	1 2 8 GO TO A 17	☐	1 2 8 GO TO A21	☐☐	1 2 8 GO TO A 21
09	☐	1 2 8 GO TO A17	☐☐	1 2 8 GO TO A 17	☐	1 2 8 GO TO A21	☐☐	1 2 8 GO TO A 21
10	☐	1 2 8 GO TO A17	☐☐	1 2 8 GO TO A 17	☐	1 2 8 GO TO A21	☐☐	1 2 8 GO TO A 21

Qs. A14 AND A17
RECORD '00' IF PARENT IS NOT LISTED IN THE HOUSEHOLD SCHEDULE.

SECTION A (CONT.) HOUSEHOLD SCHEDULE

LINE NO.	IF AGE 0-17 YEARS						
		CHECK QS.A15 AND A18:	CHECK Q.A13 AND Q.A17:	BROTHERS		SISTERS	
	Is (NAMES)'s father still sick? YES = 1 NO = 2 DK = 8 NR = 9	CIRCLE LINE NUMBER FOR THE CHILD WHOSE MOTHER OR FATHER HAS DIED OR WHOSE BOTH PARENTS ARE DEAD (Q.A13 AND A16 OR IS STILL SICK (Q.A16 AND QA20).	IF YES TO Q.A13 AND Q.A17 (BOTH PARENTS ALIVE), CIRCLE '1', OTHER-WISE CIRCLE '2'.	Does (NAME) have any natural brothers under the age of 18? By natural brothers I mean born to the same mother and same father.	Do all of (NAME)'s natural brothers under the age of 18 live in this household? YES = 1 NO = 2 DK = 8 NR =9	Does (NAME) have natural sisters under the age of 18 ? By natural sisters, I mean born to the same mother and father	Do all of (NAME)'s natural sisters under the age of 18 live in this household? YES = 1 NO = 2 DK = 8 NR =9
(A01)	(A20)	(A21)	(A22)	(A23)	(A24)	(A25)	(A26
	☐	01	Y N 1 2 GO TO NEXT LINE	Y N DK 1 2 8 GO TO A25	☐	Y N DK 1 2 8 GO TO NEXT LINE	☐
	☐	02	1 2 GO TO NEXT LINE	1 2 8 GO TO A25	☐	1 2 8 GO TO NEXT LINE	☐
	☐	03	1 2 GO TO NEXT LINE	1 2 8 GO TO A25	☐	1 2 8 GO TO NEXT LINE	☐
	☐	04	1 2 GO TO NEXT LINE	1 2 8 GO TO A25	☐	1 2 8 GO TO NEXT LINE	☐
	☐	05	1 2 GO TO NEXT LINE	1 2 8 GO TO A25	☐	1 2 8 GO TO NEXT LINE	☐
	☐	06	1 2 GO TO NEXT LINE	1 2 8 GO TO A25	☐	1 2 8 GO TO NEXT LINE	☐
	☐	07	1 2 GO TO NEXT LINE	1 2 8 GO TO A25	☐	1 2 8 GO TO NEXT LINE	☐
	☐	08	1 2 GO TO NEXT LINE	1 2 8 GO TO A25	☐	1 2 8 GO TO NEXT LINE	☐
	☐	09	1 2 GO TO NEXT LINE	1 2 8 GO TO A25	☐	1 2 8 GO TO NEXT LINE	☐
	☐	10	1 2 GO TO NEXT LINE	1 2 8 GO TO A25	☐	1 2 8 GO TO NEXT LINE	☐

SECTION A (Cont.): HOUSEHOLD SCHEDULE

LINE NO.	IF AGE 12 YEARS AND ABOVE								
	MARITAL STATUS	ECONOMIC ACTIVITY STATUS					CURRENTLY WORKING OR EVER WORKED		
	What is ...'s current marital status?	Aside from his/her housework did ...work at least 1 hour during the last 30 days?	Why did ... not work during the last 30 days? (SEE CODES BELOW)	Did ... do one of the activities listed below? (SEE CODES BELOW)	Is ... available to work? YES = 1 NO = 2 DK = 8 NR =9	Has... been seeking work during the last 30 days? YES = 1 NO = 2 DK = 8 NR =9	What type of work did ... do in the last 30 days?	What is ...'s status in the occupation?	What is the main product, service or activity of ...'s place of work?
(A01)	(A27)	(A28)	(A29)	(A30)	(A31)	(A32)	(A33)	(A34)	(A35)
01		Y N DK 1 2 8 GO TO A33							
02		1 2 8 GO TO A33							
03		1 2 8 GO TO A33							
04		1 2 8 GO TO A33							
05		1 2 8 GO TO A33							
06		1 2 8 GO TO A33							
07		1 2 8 GO TO A33							
08		1 2 8 GO TO A33							
09		1 2 8 GO TO A33							
10		1 2 8 GO TO A33							

CODES FOR A27

1. NEVER MARRIED
2. MARRIED
3. CONSENSUALLY M.
4. DIVORCED/SEPER.
5. WIDOWED

CODES FOR A29

0. HOMEWORKER
1. NON-WORKER (NEVER WORKED)
2. ON LEAVE, BUT HAS JOB → GO TO A33
3. RETIRED → GO TO A31
4. STUDENT
5. OTHER

CODES FOR Q. 30

1. FARMING/REARING ANIMALS/FISHING
2. PRODUCTION/SERVICES/SELLING
3. HOUSEWORKER AT SOMEONE'S HOUSE

GO TO A34

4. HOMEWORKER AT OWN HOUSE
5. NONE

Note for A32

GO BACK TO NEXT LINE;
OR, IF NO MORE PERSONS AGE 12 YEARS AND ABOVE, GO TO A101.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
A101	How was this plot acquired?	Chief . . . . . 01 Inheritance . . . . . 02 Purchased. . . . . 03 Allocated by authority . . . . . 04 Rented. . . . . 05 squatter. 06	
A102	What is the tenure status of this plot?	Owner . . . . . 01 Rented. . . . . 02 Allocated by authority. . . . . 03 Other. 96	
A102A	What is the tenure status of the household's main housing unit?	OWNER OCCUPIED. . . . . 01 EMPLOYER PROVIDED (SUBSIDIZED) . . . . . 02 RENTED . . . . . 03 EMPLOYER PROVIDED (FREE) . . . . . 04 FREE 05	A10 A10 A10
A102B	Do you pay any loan towards the construction of this house	YES. . . . . 01 NO 02	A10
A102C	How much per month is household spending to service the housing loan?	SZL	A10
A102D	From whom do you rent this dwelling?	SWAZILAND NATIONAL HOUSING BOARD . . . 01 TIBIYO TAKANGWANE . . . . . 02 PRIVATE COMPANY . . . . . 03 PRIVATE INDIVIDUAL . . . . . 04 OTHER (SPECIFY). 96	
A102E	How much does household pay per month to rent this dwelling?	SZL	A10
A102F	Estimate the rent the household could pay/receive if rented this dwelling or one exactly like it to another person?	SZL	
A103	What is the main material of the roof?	Grass. . . . . 01 Corrugated Iron. . . . . 02 Asbestos. . . . . 03 Tiles/Slate/Concrete. . . . . 04 Traditional hut. . . . . 05 Other. 96	
A104	What is the main material of the wall?	Mud and Poles. . . . . 01 Stone. . . . . 02 Grass. . . . . 03 Wood. . . . . 04 Cement bricks/blocks. . . . . 05 Corrugated iron . . . . . 06 Mud blocks. . . . . 07 Traditional hut. 08	
A105	What is the main material of the floor?	Earth. . . . . 01 Dung. . . . . 02 Wood. . . . . 03 Tiles. . . . . 04 Cement. 05	

A106	How many rooms do the housing units have, exlcuding bathrooms, toilets, storerooms and garage?	☐☐	
A107	How many of these rooms are used for sleeping?	☐☐	
A108	How many persons usually sleep in the housing units?	☐☐	
A109	What is the main source of drinking water for members of your household?	**PIPED WATER** PIPED INTO HOUSING ..... 01 PIPED TO YARD/PLOT ..... 02 →A11 PUBLIC TAP/STANDPIPE ..... 03 BOREHOLE ..... 04 **DUG WELL** PROTECTED WELL ..... 05 UNPROTECTED WELL ..... 06 **WATER FROM SPRING** PROTECTED SPRING ..... 07 UNPROTECTED SPRING ..... 08 RAINWATER ..... 09 →A11 TANKER TRUCK ..... 10 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL) ..... 11 BOTTLED WATER ..... 12 →A11 OTHER _____ 96 (SPECIFY)	
A110	How long does it take to go there, get water, and come back?	In yard ..... 01 less than 30 mins. ..... 02 30 mins to 1 hr. ..... 03 1 hr to 1.5 hrs. ..... 04 1.5 hrs to 2 hrs. ..... 05 2 hrs or more. 06	
A111	Who usually goes to this source to fetch the water for your household?	ADULT WOMAN ..... 1 ADULT MAN ..... 2 FEMALE CHILD UNDER 18 YEARS OLD ..... 3 MALE CHILD UNDER 18 YEARS OLD ..... 4 OTHER _____ 96 (SPECIFY)	
A112	What kind of toilet facility do members of your household usually use?	FLUSH TOILET ..... 01 VENTILATED IMPROVED PRIVY ..... 02 ORDINARY PIT TOILET ..... 03 BUSH/FIELD ..... 04 OTHER _____ 96 (SPECIFY)	
A113	What is the main source of energy that is usually used by the household for lighting?	ELECTRICITY ..... 01 PARAFFIN ..... 02 GAS ..... 03 CANDLE ..... 04 WOOD ..... 05 SOLAR ..... 06 OTHER 96	

A114	What type of fuel does your household mainly use for cooking?	ELECTRICITY		01
		PARAFFIN		02
		GAS		03
		COAL		04
		WOOD		05
		OTHER		96
A115	Does the household have the following assets in functioning condition?		YES	NO
	A Radio?	RADIO	1	2
	A television?	TELEVISION	1	2
	A refrigerator/freezer?	REFRIGERATOR/FREEZER	1	2
	A stove/hot plate?	STOVE/HOT PLATE	1	2
	A Bicycle?	BICYCLE	1	2
	A motorcycle?	MOTORCYCLE	1	2
	A car?	CAR	1	2
	A van/bakkie/truck?	VAN/BAKKIE/TRUCK	1	2
	A tractor?	TRACTOR	1	2
	A computer?	COMPUTER	1	2
	A telephone	TELEPHONE	1	2
	A cellular phone?	CELLULAR PHONE	1	2
	Access to the internet?	ACCESS TO THE INTERNET	1	2
	Grinding machine	GRINDING MACHINE	1	2

ACCESS TO CREDIT

C01 Over the past 12 months did you or anyone else in the household borrow from someone outside the household or from an institution receiving either cash, goods or services? YES. . . . . .1 NO... . . . .2 [ ] IF NO, GO TO C10

	What are the names of institutions/ persons from whom you or anyone else in your houe-hold borrow-ed over the past 12 months (SEE CODES BELOW) LIST ALL NAMES BE-RE GOING TO C04	CODE SOU-RCE OF LOAN (SEE CODES BELOW)	Which house-hold mem-ber? WRITE LINE NUMBER OF HH MEMBER	What was the main reason for obtaining a loan? (SEE CODES BELOW)	How much was borro-wed?	When did you get the loan? STATE MONTH & YEAR JAN=01 YR=02	How much is outsta-nding?	During the last 12 months did any-one try to borrow from someone outside the household and or from an insti-tution and were turned down? YES.. . . . .1 NO... . . . .2 STILL AWAITING WORD ON LOAN . . . . . 3 IF NO GO TO C12	Who turned you down? (SEE CODES BELOW)	Why did no one not attempt to borrow in the last 12 months? (SEE CODES BELOW) PROBE FOR MOS IMPORTANT REASON
C02	C03	C04	C05	C06	C07	C08	C09	C10	C11	C12
1								member 1 [ ]	[ ]	[ ]
2								member 2 [ ]	[ ]	
3								member 3 [ ]	[ ]	
4								member 4 [ ]	[ ]	
5								member 5 [ ]	[ ]	
6										
7										
8										

CODES FOR C04

COMMERCIAL BANKS 01
SWAZILAND BUILDING SOCIETY. 02
MICRO-FINANCE INSTITUTION (E.G. SELECT MNGT SERVICES, FINCORP BLUE MONEY ECT.). 03
CO-OPERATIVE (E.G. SNAT BUNYE BETFU, ASIKHUTULISANE IMBITA ETC.) 04
INSURANCE COMPANY 05
OTHER FINANCIAL INST. 06
NEIGHBOUR/FRIEND 07
MONEY LENDER (SHYLOCK) 08
EMPLOYER 09
RELIGIOUS INST. 10
RELATIVE. . . . . '11
NGO. 12
OTHER (SPECIFY). 13

CODES FOR C06

SUBSISTENCE NEEDS 01
SCHOOL FEES 02
MEDICAL COST 03
FUNERAL 04
WEDDING 05
PURCHASE PROPERTY (E.G. LAND, HOUSE). 06
PURCHASE FARM INPUTS. 07
PURCHASE CAR. 08
TO START A BUSINESS 09
OTHER (SPECIFY) 10

NO NEED. . . . . (
BELIEVED WOULD BE REFUSED. . . . . (
INADEQUATE COLLATERAL . . . . . (
DO NOT LIKE TO BE IN DEBT. . . . . (
DO NOT KNOW ANY LENDER. . . . . (
OTHER (SPECIFY). . . . . (

RECENT SHOCKS TO HOUSEHOLD WELFARE (EVENTS OCCURING SINCE 2004)

	Since 2004 **(last 5 yrs)** was your household severely affected by any of the following events? GO THROUGH ENTIRE LIST BEFORE PROCEEDING TO RC 03 IF ALL NO, PROCEED TO NEXT SECTION		Rank the 3 most significant **SHOCKS** you experienced MOST SEVERE . . . . . .1 2ND MOST SEVERE. . . . . 2 3RD MOST SEVERE. 3	How many times did this shock occur in the last 5 years?	What was the estimated value lost due to this **SHOCK**? IF SHOCK OCCURRED MORE THAN ONCE GIVE ESTIMATE FOR MOST RECENT SHOCK	Did this **SHOCK** cause a reduction in household income or assets? INCOME LOSS . . . . 1 ASSET LOSS. . . . . 2 LOSS OF BOTH 3	This **SHOCK** affected: (READ) OWN HH ONLY . . . . 1 SOME OTHER HH TOO. . . . . .2 MOST HH IN COMMUNITY. . . . . .3 ALL HH IN COMMUNITY. 4	How long ago did this **SHOCK** occur?		What did you do in response to this **SHOCK** to try to cope regain your former welfare level? LIST UP TO 3 BY ORDER OF IMPORTANCE SEE NEXT PAGE FOR THE CODES		
RC 01	RC 02		RC 03	RC03A	RC 04	RC 05	RC 06	RC 07		RC 08		
		Y N			SZL			YRS	MNTHS	1ST	2ND	3RD
	Drought or floods	1 2										
	Crop disease or or crop pests	1 2										
	Livestock died or were stolen	1 2										
	Household business failure (non-agric.)	1 2										
	Loss of salaried employment or non payment of salary	1 2										
	End of regular assistance, aid or remmittances from outside household	1 2										
	Large fall in sale prices for crops	1 2										
	Large rise in price for food	1 2										
	Large rise in agric. input prices	1 2										
	Chronic/severe illness or accident of household member	1 2										
	Birth in the household	1 2										
	Death of household head	1 2										
	Death of working member of household	1 2										

	Since 2004 (last 5 yrs) was your household severely affected by any of the following events? GO THROUGH ENTIRE LIST BEFORE PROCEEDING TO RC 03 IF ALL NO, PROCEED TO NEXT SECTION		Rank the 3 most significant **SHOCKS** you experienced MOST SEVERE . . . . . 1 2ND MOST SEVERE. . . . . 2 3RD MOST SEVERE. 3	How many times did this shock occur in the last 5 years?	What was the estimated value lost due to this **SHOCK**?	Did this **SHOCK** cause a reduction in household income or assets? INCOME LOSS . . . . 1 ASSET LOSS. . . . . 2 LOSS OF BOTH 3	This **SHOCK** affected: (READ) OWN HH ONLY . . SOME OTHER HH TOO. . . . . . MOST HH IN COMMUNITY. . . . . . ALL HH IN COMMUNITY.	How long ago did this **SHOCK** occur?		What did you do in response to this **SHOCK** to try to cope regain your former welfare level? LIST UP TO 3 BY ORDER OF IMPORTANCE SEE CODES BELOW		
RC 01	RC 02		RC 03	RC03A	RC 04	RC 05	RC 06	RC 07		RC 08		
		Y N			SZL			YRS	MNTHS	1ST	2ND	3RD
	Death of other family member	1 2										
	Break-up of the household	1 2										
	jailed	1 2										
	fire/storm	1 2										
	Other 1	1 2										

CODES FOR RC 08

STARTED TO SAVE CASH.	01
SENT CHILDREN TO LIVE WITH RELATIVES.	02
SOLD ASSETS (TOOLS FURNITURE, CAR ETC.).	03
SOLD FARM LAND.	04
RENTED OUT FARMLAND	05
SOLD LIVESTOCK OR POULTRY.	06
SOLD HARVESTED CROPS E.G MAIZE.	07
WORKED MORE, WORKED LONGER HOURS	08
OTHER HOUSEHOLD MEMBERS WHO WERE NOT WORKING WENT TO WORK	09
STARTED A NEW BUSINESS	10
REMOVED CHILDREN FROM SCHOOL TO WORK	11
WENT ELSEWHERE FOR MORE THAN A MONTH TO FIND WORK	12
BORROWED MONEY FROM RELATIVES	13
BORROWED MONEY FROM MONEY LENDER	14
BORROWED MONEY FROM INSTITUTIONS E.G BANK OR CO-OPERATIVE	15

CODES FOR RC 08 (CONT.)

RECEIVED HELP FROM RELIGIOUS INSTITUTIONS	01
RECEIVED HELP FROM NGO	02
RECEIVED HELP FROM GOVERNMENT.	03
RECEIVED HELP FROM FAMILY/FRIENDS	04
REDUCED FOOD CONSUMPTION	05
CONSUMED LOWER COST BUT LESS PREFERRED FOODS.	06
REDUCED NON FOOD EXPENDITURES.	07
OTHERS SPECIFY _____	97

NOTE FOR RC 04 TO RC 07:
THESE QUESTIONS SHOULD ONLY BE ASKED OF THE 3 MOST SEVERE SHOCKS AS NOTED IN RC 03. LEAVE ALL OTHER ROWS BLANK.

SECTION C MAJOR HOUSEHOLD EXPENDITURE

CO1: AGRICULTURAL INCOME AND EXPENDITURE

During the past 12 months has your household grown any of the following? YES NO crops . . . . . 1 2 vegetables. . 1 2 fruits. . . . . 1 2 IF ALL NO, GO TO C10	Please give me a list of all the crops that members of the household farmed in the past 12 months SEE CODES BELOW	How much (…) did the household harvest in the last 12 months? (IN KG) IF NONE, WRITE 0 AND SKIP TO NEXT CROP	INDICATE UNIT OF MEASURE	How much of the harv-ested (. . . .) was consumed? (IN KG) IF NONE, WRITE 0 AND SKIP TO C06	INDICATE UNIT OF MEASURE	What was the appro-imate value of . . . . consumed?	How much of the harv-ested..... was sold? (IN KG) IF NONE, WRITE 0 AND SKIP TO C08	INDICATE UNIT OF MEASURE	What was the appro-imate value of . . . . sold?	How much of the harv-ested..... was given out? (IN KG) IF NONE, WRITE 0 AND SKIP TO C10	INDICATE UNIT OF MEASURE	What was the approxi-mate value of … given out?
C01	C02	C03	CO3A	C04	CO4A	C05 (SZL)	C06	C05A	C07 (SZL)	C08	C08A	C09(SZL)

RE-WRITE BELOW ALL THE CODES LISTED IN C02 IN THE SAME ORDER	How much (….) did the household have before the harvest season? i.e. from previous harvest IF NONE, WRITE AND SKIP TO NEXT CROP	INDICATE UNIT OF MEASURE	What was the approximate value of (…) from previous harvest?	How much of the harvested (…) was lost or damaged? IF NONE, WRITE 0 AND SKIP TO C10	INDICATE UNIT OF MEASURE	What was the approximate value of the lost or damaged (…)?
C09A	C09B		C09C (SZL)	C09D	C09E	C09F (SZL)
—						

Cash crops

Maize	201
Cotton	202
Other (specify)	203

Vegetables

Beans	204
Potatoes	205
Pumpkin	206
Groundnuts	207
Jugo beans (tindlubu)	208
Cabbage	209
Spinach	210
Onion	211
Beetroot	212
Carrots	213
Cassava	214
Sweet potatoes	215
Other (specify)	216

Fruits

Avocado	217
Mango	218
Peaches	219
Grapes	220
Guavas	221
Oranges	222
Litjies	223
Plum	224
Nartjies	225
Other (specify)	226

During the past 12 months have you or any other member of your household owned any livestock and/or poultry either here or elsewhere in Swaziland? YES. . . . . 1 NO . . . . . 2 IF NO, GO TO C17		Please give me the types of animals and/or poultry that you or any member of your household raised or owned in the last 12 months SEE CODES BELOW	How many does the household own at present?	How many (...) did the household sell during the last 12 months IF NONE WRITE 0 AND SKIP TO C13	How much did the household receive for the sale of all these during the last 12 months	How many (...) did the household consume during the last 12 months	What was the the approximate value of ... sold?
C10	C11	C12	C13	C14	C16 (SZL)	C17	C18

CODES FOR C11

CATTLE.	220
GOATS.	223
SHEEP.	224
PIGS.	225
CHICKEN.	226
DOVES.	227
OTHER.	096
(SPECIFY)	

Did you or any member of your household buy any farm inputs and/or tools in the last 12 months? YES. . . . . 1 1 NO . . . . . 2 2 IF NO, GO TO NEXT SECTION	What farm inputs and/or implements did you or other member of the household buy in the last 12 months? SEE CODES ALONGSIDE	What quantity of (...) did you or any other member buy?	INDICATE THE UNIT OF MEASURE	How much did (...) cost
C17	C18	C19	C19A	C20 (SZL)

CODES FOR C18

SEEDS	01
MANURE	02
HIRED A TRACTOR	03
SMALL FARM IMPLEMENTS (E.G. HOE FORK ETC.)	04
FARM REPAIR (E.G. FENCING)	05
HIRED OXEN/DONKEYS	06
FERTILIZER:	
2:3:2.22 . . . . . U/	
2:3:2.37	08
2:3:2.38	09
2:3:4.40	10
515 46	11
DAP	12
LAN 27	13
LAN 30	14
LAN 37	15
UREA 46	16
MAP	17
SUPER PHOSPHATE	18
OTHER (SPECIFY)	19

C014: MEDICAL EXPENDITURE (NON-REFUNDABLE)

Did you or any member of your household seek medical attention of any kind including a visit to a clinic or hospital or private doctor or a traditional healer or a visit to the pharmacy to buy drugs in the last **4 weeks** YES. . . . . 1 NO . . . . . 2 IF NO, GO TO C28	Give me the names of all members of the household who sought medical attention or visited a pharmacy in the last 4 weeks COPY LINE NUMBER(S) OF THESE PERSONS FROM SECTION A	What sort of sickness/ injury did NAME suffer from? SEE CODES ALONGSIDE	Who diagnosed NAME'S illness?	What kind of health facility did NAME visit?	How many times did NAME use health facility due to the sickness/ injury in the last 4 weeks?	How much did NAME pay for the total medical bill? RECORD AMOUNT PAID BY HOUSEHOLD MEMBER. EXCLUDE RE-IMBURSEMENTS BY EMPLOYER
C21	C22	C23	C24	C25	C26	C27

CODES FOR C24

MEDICAL WORKER (DOCTOR, NURSE).	01
TRADITIONAL HEALER.	02
HERBALIST.	03
FAITH HEALER.	04
OTHER (SPECIFY).	05

CODES FOR C25

GOVT HOSPITAL	01
GOVT HEALTH CENTRE. . . .	02
GOVT CLINIC	03
PRIVATE HOSPITAL.	04
PRIVATE DOCTOR.	05
MISSION HOSPITAL.	06
MISSION CLINIC.	07
TRADITIONAL HEALER	08
PHARMACY	09
OTHER (SPECIFY).	10

CODES FOR C23

DIARRHOEA	01
VOMITING	02
STOMACH ACHE	03
FLU.	04
ASTHMA.	05
HEAD ACHE.	06
SKIN PROBLEM.	07
DENTAL PROBLEM.	08
EYE PROBLEM	09
EAR, NOSE THROAT.	10
BACKACHE	11
HEART PROBLEM	12
BLOOD PRESSURE	13
DIABETIS	14
PAIN DURING URINATION	15
BURN	16
SEXUALLY TRANSMITTED INFECTION	17
FRACTURE	18
WOUND	19
POISONING	20
PREGNANCY RELATED	21
HIV/AIDS	22
UNSPECIFIED LONG ILLNESS	23
OTHER (SPECIFY)	24

REGULAR MONTHLY AND ANNUAL PAYMENTS

Apart from rent, do you or any member of the household pay(s) for certain expenses on a monthly basis such as water, electricity, insurance? etc? YES. . . . . 1 NO . . . . . 2 IF NO, GO TO SECTION	Give me a list of these items that you or any member of of the household pay(s) for on a monthly basis SEE CODES BELOW	What was the total cost for ..... in the last month?	Do you or any member of the household pay(s) for certain expenses on a yearly basis? such as car insurance, club membership fees insurance etc? YES. . . . . NO . . . . . IF NO, GO TO	Give me a list of these items that you or any member of of the household pay(s) for on a yearly basis SEE CODES BELOW	What was the total cost for ..... in the last year?
C28	C29	C30	C31	C32	C33

CODES FOR C29

ELECTRICITY.	340
TELEPHONE (FIXED LINE)	341
CELL PHONE CONTRACT	342
MEDICAL AID SUBSCRIPTIONS	343
REPAYMENT OF FURNITURE LOAN	344
CAR INSURANCE PREMIUM	345
LIFE INSURANCE PREMIUM	346
BURAL SCHEME.	347
LOCAL AUTHORITY RATES	348
OTHER (SPECIFY)	096

CODES FOR C32

CAR INSURANCE PREMIUM	360
LIFE INSURANCE PREMIUM	361
LOCAL AUTHORITY RATES	362
SUBSCRIPTIONS	363
OTHER (SPECIFY)	096

NB LOCAL AUTHORITY RATES APPLY TO PROPERTY OWNERS ONLY

SECTION B: HOUSEHOLD INCOME

B 01: SOURCES OF HOUSEHOLD INCOME

Before asking you specfic details about your household income, we would like to know the sources of your household income
a) during the past 30 days
b) during the past 12 months

The first column of boxes is for indicating the various sources of income during the past 30 days
The second column is for indicating the different income sources during the past 12 months

TICK ALL APPLICABLE BOXES

	Sources of income during past 30 days	Sources of income during past 12 months
011. Cash wage/salary from employment	☐	☐
012. Business Income	☐	☐
013. Rental Income	☐	☐
014. Pension	☐	☐
015. Interest on Savings	☐	☐
016. Sale of Own Produce	☐	☐
017. Sale of Livestock	☐	☐
018. Sale of Property	☐	☐
019. Remittances from inside Swaziland	☐	☐
020. Remittances from outside Swaziland	☐	☐
021. Cash gifts received	☐	☐
022. Cash loans received including salary advance	☐	☐
023. Assistance from disaster task force/NGO	☐	☐
024. Social grants e.g. Package for the elderly from MOHSW	☐	☐

IF NONE OF THE BOXES 1-13 IN THE FIRST COLUMN HAVE BEEN TICKED, PLEASE ASK THE HOUSEHOLD HOW THEY OBTAINED THE MONEY THEY NEEDED DURING THE PAST 30 DAYS TO MEET THEIR EXPENDITURE REQUIREMENTS

RECORD THEIR ANSWER BELOW:

_____

_____

N.B PLEASE NOTE THAT THE PAST 12 MONTHS REFERS TO THE 12 MONTH PERIOD PRECEEDING THE SURVEY AND NOT NECESSARILY THE CALENDER YEAR

B011: CASH WAGE/SALARY FROM EMPLOYMENT IN PAST 30 DAYS

CHECK SECTION A TO IDENTIFY INDIVIDUALS WHOSE INFORMATION HAS BEEN GIVEN FOR A31 THROUGH A34 , PLEASE ENTER HERE ITEMISED DETAILS OF THEIR TOTAL EARNINGS AND DEDUCTIONS FOR ALL THE WORK THEY DID IN THE PAST 30 DAYS.

ASK TO SEE EMPLOYEE'S PAY SLIP. COPY THE INFORMATION FROM THE PAY SLIP AS REQUESTED BELOW.

Line number →							
		SZL					
Gross wage or salary							
Back pay/bonuses/overtime							
Car allowance							
Housing allowance							
Other allowances (specify)							
Value of wages in kind	maize						
	other food						
	clothing						
	other goods (specify)						

DEDUCTIONS FROM WAGE/SALARY

Income tax							
House rent							
Car insurance							
Repayment of loans (SPECIFY)							
Pensions contributions							
Trade union subscriptions							
Contribution to medical aid scheme							
Other deductions (SPECIFY)							

B012: HOUSEHOLD ENTERPRISES

THIS SECTION ASKS FOR INFORMATION ABOUT HOUSEHOLD BUSINESS OR ENTERPRISES IN WHICH CASE THE HOUSEHOLD MEMBER (S) MAY EITHER BE;

A) SELF EMPLOYED OR,
B) WORK (S) INFORMALLY WITH A FEW OTHER FAMILY MEMBERS AND/OR A FEW PAID STAFF

THESE ACTIVITIES MAY BE FULL-TIME OR PART-TIME WORK IN WHICH YOU ARE INVOLVED AS AN EMPLOYEE.

B0120 Is your household or any member of the household involved in the running of such an enterprise?

YES 1
NO . . . . . 2 → SKIP TO C01
DK 8

PLEASE LIST BELOW ALL SUCH BUSINESSES IN WHICH YOU ARE ENGAGED IN. THE TYPE OF BUSINESS MAY BE AMONG THE FOLLOWING. THE CODES SHOWN ARE THE ENTERPRISE CODES TO BE USED IN ANSWER TO B121. IF THE BUSINESS TYPE IS NOT LISTED DESCRIBE THE BUSINESS IN WORDS IN THE SPACE GIVEN AND LEAVE THE CODE BOX EMPTY

SELLING CATTLE/GOATS/SHEEP	01	SELLING AIRTIME	11
SELLING POULTRY	02	HAIRDRESSING	12
SELLING MILK/EGGS	03	CARPENTRY	13
SELLING MAIZE/MILLET/SORGHUM	04	VEHICLE REPAIR/PANEL BEATING	14
SELLING FRUIT VEGETABLES	05	TRANSPORT SERVICE	15
GATHERING//SELLING FIREWOOD	06	TRADITIONAL DOCTOR	16
BREWING/SELLING BEER	07	PLUMBING	17
MAKING AND SELLING HANDICRAFT PRODUCTS	08	HOUSE CONSTRUCTION	18
e.g. BASKETS WOODEN UTENSILS		SHOE REPAIR	19
MAKING AND/OR SELLING CLOTHES	09	OTHER (SPECIFY)	20
COOKING AND/OR SELLING FOOD	10		

		BUSINESS 1	BUSINESS 2	BUSINESS 3
B121	DESCRIPTION OF ENTEPRRISE Briefly describe the exact activity in a few words ENTER THE APPROPRIATE CODE FROM THE LIST ABOVE (OR LEAVE BLANK IF THE TYPE OF BUSINESS IS NOT LISTED ABOVE)	_____ _____ _____ [ ]	_____ _____ _____ [ ]	_____ _____ _____ [ ]
B122	Which household member is the main entrepreneur in this business? GIVE SERIAL NUMBER FROM SECTION 1. IF THE MAIN ENTREPRENEUR IS CURRENTLY NOT A MEMBER OF THIS HOUSEHOLD ENTER CODE 99	[ ]	[ ]	[ ]
B123	SEX OF MAIN ENTREPRENEUR 1= MALE 2= FEMALE	[ ]	[ ]	[ ]
	Are there any other household members who have assisted in this business in the past month?	YES. . . . . 1 NO . . . . . 2 → B125		
B124	What are the serial numbers of any other household members who have helped in the business during the past month? (USE SERIAL NUMBER ASSIGNED IN SECT. A)	[ ]	[ ]	[ ]
B125	What is the ownership of this business? SOLE OWNERSHIP . . . . . 01 JOINT OWNERSHIP BY HOUSEHOLD MEMBERS ONLY . . . 02 JOINT OWNERSHIP WITH . . . . . . OTHER NON MEMBERS OF HH . . . 03 OTHER (SPECIFY). 96	[ ]	[ ]	[ ]
B126	Please state the number of people who worked last month in each business working proprietors unpaid family workers paid workers Total	[ ] [ ] [ ] [ ]	[ ] [ ] [ ] [ ]	[ ] [ ] [ ] [ ]
B127	When did this business start? STATE THE MONTH IN NUMBERS, i.e. JAN=01, FEB=02 ...DEC=12. AND RECORD THE LAST TWO DIGITS OF THE YEAR e.g. 02 FOR 2002.	[ ][ ][ ][ ]	[ ][ ][ ][ ]	[ ][ ][ ][ ]
B128	For how many months of the past 12 months has the business operated?	[ ]	[ ]	[ ]
B129	ON AVERAGE HOW MANY DAYS EACH MONTH DOES THE BUSINESS OPERATE?	[ ]	[ ]	[ ]

B130	**BUSINESS EXPENDITURE** For each business, on average how much do you spend each month on the following?			
	RAW MATERIAL			
	stock purchases			
	Other supplies			
	RUNNING EXPENSES			
	Rent			
	electricity			
	water			
	telephone			
	transport			
	wages - cash (last month)			
	OTHER EXPENSES			
	Loan repayments			
	taxes and licenses			
	other (specify)			
	TOTAL EXPENDITURE			
B131	**BUSINESS INCOME** What is the approximate total value of sales and/or other income from this business in an average month?			

CHECK B01 TO SEE IF SOURCE OF INCOME COVERS A MONTH'S PERIOD OR A PERIOD OF 12 MONTHS.IF THE PERIOD COVERED IS 12 MONTHS, THEN DEFLATE THIS AMOUNT BY SIMPLY DIVIDING BY 12 TO GET THE MONTHLY AMOUNT.

		AMOUNT RECEIVED
B013	INCOME OBTAINED FROM RENTAL OF PROPERTY SERIAL NUMBER (S) OF PERSON TO WHICH THIS INCOME CORRESPONDS TO:	
B014	INCOME FROM PENSION SERIAL NUMBER (S) OF PERSON (S) TO WHICH THIS INCOME CORRESPONDS TO:	
B015	INCOME FROM INTEREST ON SAVINGS SERIAL NUMBER (S) OF PERSON (S) TO WHICH THIS INCOME CORRESPONDS TO:	
B018	INCOME FROM SALE OF PROPERTY SERIAL NUMBER (S) OF PERSON (S) TO WHICH THIS INCOME CORRESPONDS TO:	
B019	INCOME FROM REMITTANCES FROM INSIDE SWAZILAND SERIAL NUMBER (S) OF PERSON (S) TO WHICH THIS INCOME CORRESPONDS TO:	
B020	INCOME FROM REMITTANCES FROM OUTSIDE SWAZILAND SERIAL NUMBER (S) OF PERSON (S) TO WHICH THIS INCOME CORRESPONDS TO:	
B021	INCOME FROM CASH GIFTS SERIAL NUMBER (S) OF PERSON (S) TO WHICH THIS INCOME CORRESPONDS TO:	

B022	INCOME FROM CASH LOANS INCLUDING SALARY ADVANCE SERIAL NUMBER (S) OF PERSON (S) TO WHICH THIS INCOME CORRESPONDS TO:	
B023	INCOME FROM DISASTER TASK FORCE OR NGO SERIAL NUMBER (S) OF PERSON (S) TO WHICH THIS INCOME CORRESPONDS TO:	
B024	INCOME FROM SOCIAL GRANTS E.G THE ELDER'S PACKAGE FROM MOHSW SERIAL NUMBER (S) OF PERSON (S) TO WHICH THIS INCOME CORRESPONDS TO:	

DIARY FOR DAILY EXPENDITURES

Enumeration Area No. | | | | | |

Homestead Number | | |

Household Number | | |

Name of Head of Household _____

Interviewer's Name _____

Supervisor's name _____

DATE	Description of item write the exact name of the item e.g. brown bread, milk etc. because description such groceries are not sufficiently detailed	UNIT	QUANTITY	AMOUNT PAID (SZL)		Where did you buy.....?	FOR CLOTHIN ONLY Was the item new or used when you bought it?
				E	C		

HOUSEHOLD CASH RECEIPTS

DATE	LINE NO.	Describe type of household cash receipt Was the money received as wages, gifts, allowances, pensions, receipt of loan repayment etc.? please specify	AMOUNT RECEIVED (SZL)	ITEM CODE

GOODS AND SERVICES RECEIVED

DATE	Were these goods and services received as gifts, wages in kind rations, food aid, barter or other (please specify)	Describe the goods/ser received and state the approximate quantity	Estimated Value (SZL)	Item Code

GOODS AND SERVICES GIVEN

DATE	Were these goods and services received as gifts, wages in kind rations, food aid, barter or other (please specify)	Describe the goods/ser given and state the approximate quantity received e.g. 1 bag of maize, 1 goat, one day's ploughing	Estimated Value (SZL)	Item Code

OWN PRODUCE CONSUMED

DATE	line No.	Describe the item consumed or used in some other way	Approximate quantity consumed (if applicable e.g. 2 cups, 2 plates 1 bundle	Estimated Value (SZL)	Item code